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EDITORS AND ASSOCIATES

F. J. Schlink R. Joyce D. C. Aten

M. C. Phillips Erma A. Hinek

F. X. Hinek Donald M. Berk James B. Rothschild

EDITORIAL ASSISTANTS

Mary F. Roberts B. Beam Ellen J. Snyder

BUSINESS MANAGER C. D. Cornish

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From the editors

Note on the use of this Annual, and the difficult matter of the prices of things

To ALL of the many thousands of consumers who refer to this book, we express our hope that the compilation of information on a wide range of subjects will provide a convenient, time- and money-saving handbook of buying. The *Annual* is intended to provide a quick reference on a great many of the products that you may want to buy in 1958 and 1959. Much fuller reports and more detailed ratings are usually to be found in previous issues of the monthly CONSUMER BULLETIN; articles in the monthly issues usually discuss in some detail methods of test and the many factors that determine ratings.

The information in this *Annual* is necessarily highly condensed in order that we may include a wide range of subjects and ratings in the 224 pages.

In a good many instances, the *Annual* presents information that has not previously appeared in one of the monthly issues. Sometimes we include material from BULLETINS published some years back, for many articles are made and sold year after year without substantial changes. A fact consumers need to keep in mind is that model changes of some appliances reflect only differences in finish, gadgets, or minor details, of outlines, knobs, trim, etc., and are often of a sort not significantly affecting performance.

Prices

The prices given in this *Annual* are in most cases the retail selling prices prevailing at the time the items were obtained by Consumers' Research for test. As consumers know, however, prices differ from store to store and from one town to another. A survey made in eight major cities early in 1958 showed that a steam iron with a list price of $16.95 was sold at prices ranging from $9.22 to $13.60. A well-known electric mixer listed at $21 sold at $12.54 to $16.99.

It is impossible for Consumers' Research, or for any other agency, to keep up to date on selling prices in your locality, for on some items prices change so rapidly that even professional comparison shoppers for department stores must re-survey week after week to keep their own stores' selling prices competitive.

The consumer will find it worth while to do comparison shopping of his own, since many items—90 percent of the small appliances, it is reported, and many large ones as well—may be bought at substantial discounts (as much as 40 percent off list price). Sometimes the list price is fictitious, set high in order to make the actual selling price seem specially attractive. Be careful, therefore, not to be taken in by fictitious comparative pricing in ads, so-called "price-bait advertising." Keep in mind that comparisons must be made of similar models. Don't compare a de luxe model electric range with a stripped model, for example, or a frypan or TV set of reputable make with one of an unadvertised or little-known make.

Remember that the availability of service can be very important; a bargain-priced automatic washer, for example, will be no bargain if you can't get service promptly, at a reasonable charge, when you need it. And bear in mind that all complicated appliances may be expected to require service a number of times during their useful life. Today's automatic washer-dryer combination, with its intricate mechanical and electrical details, is a far cry, in service requirements, from the power wringer washer of 30 years ago.

How to use the ratings

It is the aim of Consumer's Research to act as scientific and engineering consultants to individual consumers who desire expert advice on the goods and services which they buy. We do not tell them what is the "best buy" for them—what is best for anyone depends upon that person's income and tastes—but we do provide information on the basis of which each consumer can choose intelligently for himself in the light of his own needs and pocketbook. To facilitate effective choice, for persons of varying tastes and inclinations, we give quality ratings and price ratings separately in the listings as a rule.

The omission of a brand or a model of a product is not to be taken as indicating any judgment of the product, favorable or unfavorable.

References to BULLETIN articles are given where pertinent, in order to help the reader locate the longer and more detailed reports in the monthly issues.

Symbols

For a list of the symbols used in this *Annual*, see page 23.

Major kitchen appliances

Dishwashers • ranges • built-ins • refrigerators

refrigerator-freezers • freezers • household garbage disposal

AUTOMATIC DISHWASHING MACHINES

Many things must be taken into consideration in buying an automatic dishwasher.

First of all, one must decide on capacity. Some dishwashers handle a relatively small number of dishes, and though satisfactory for a small family, would be inadequate if there was an addition—or even a guest or two for dinner.

Consider also whether an under-counter, free-standing, or portable model will serve best. Built-in models of dishwashers offer greater convenience, but will require a substantial outlay for the installation of the water connection and drain. Portable models require space for storage while not in use. With the portable, the homemaker must attach the water hose each time and place the drain hose in the sink. Some machines are loaded from an opening in the top and others from the front. Some are so designed that it is not necessary to load the bottom rack before filling the top rack (CR found this to be the more convenient design).

Machine dishwashing has certain limitations that should be recognized at the outset. Odd-sized, extra-large, and odd-shaped dishes, for example, are often difficult to fit into the racks.

All dishwashers are at a decided disadvantage in cleaning pieces that have residual bits of sticky food, such as gravy or food sauces, or food that has stuck or been burned on. Be prepared to wash by hand those pieces not washed in the machine, such as pots and pans, occasional pieces of tableware, and other pieces which need rubbing or "elbow grease" to remove particles of food. You will need ample hot water—at 140 to 150 degrees—with water pressure no lower than 30 pounds per square inch.

It is recommended that a detergent be used which is specially formulated for use in a dishwasher. Spots and stains on glasses and dishes are likely to occur if the right detergent is not used. *Cascade, Finish,* and *Thanx* are three that are formulated to avoid excessive spotting. Such detergents have their disadvantages and should be used with discretion because of their strong action and the possibility of causing corrosion.

CR did not find any automatic dishwasher entirely satisfactory. While some of the machines tested washed dishes and glasses satisfactorily enough and received *A-Recommended* ratings, none gave results equal to those one can secure by careful washing in a pan or sink. Flatware was a special problem. Many of the knives, forks, and spoons washed in dishwashers were not quite clean and had to be washed again by hand. None of the machines tested reached sufficiently high temperatures during the wash cycle to sterilize the dishes.

Cost of operation per month for electricity at 3.5 cents per kilowatt-hour averaged about $2 a month.

A. RECOMMENDED

American Kitchens, Model DW-2430 (American Kitchens, Div. of Avco Mfg. Corp., Connersville, Ind.) $315. A front-loading, under-counter model. Time required for complete cycle, 34 min. Used 6.8 gal. of hot water. Performance in washing dishes and silverware (knives, forks, spoons), good. Operation of the machine was relatively noisy.

Frigidaire, Model DWUW (Frigidaire, Div. of General Motors Corp., Dayton 1, Ohio) $320. A front-loading, under-counter model. Time required for complete cycle, 45 min. Used 11.6 gal. of hot water. Performance in washing dishes and silverware, good.

Hotpoint, Model MCP27 (Hotpoint Co., Chicago 44) $370. A front-loading, portable model. Complete cycle, 53 min. Used 10.7 gal. of hot water. Performance: dishes, good; silverware, poor. Loading of large pieces such as platters was somewhat difficult.

Hotpoint, Model MCP28 (Hotpoint Co.) $340. A front-loading, under-counter model. Similar to *Hotpoint MCP27* in design and performance.

KitchenAid, Model KD-12P (The Hobart Mfg. Co., Troy, Ohio) $345. A front-loading, under-counter model. Complete cycle, 43 min. Used 9.1 gal. of hot water. Performance: dishes and silverware, very good, but capacity was below average.

B. INTERMEDIATE

American Kitchens Roll-o-matic, Model DW-2205 (American Kitchens, Div. of Avco Mfg. Corp.) $220. A top-loading portable machine. Complete cycle, 34 min. Used 6.2 gal. of hot water. Performance: dishes, fair to good; silverware, fairly good.

General Electric, Model SU-60P (General Electric Co., Louisville 1, Ky.) $300. A drawer-type, top-loading, under-counter model. Complete cycle, 37 min. Used 10.6 gal. of hot water. Performance: dishes and silverware, fair. Somewhat noisy in operation. Machines equipped with the "Rinse-Dry" ejector—for adding a liquid wetting agent in the final rinse—would be *C. Not Recommended,* for with the ejector there was excessive electrical leakage current on the sample tested, indicating a substantial degree of shock hazard.

Kelvinator, Model UDW-P (American Motors Corp., Detroit 32) $320. A front-loading, under-counter model. Complete cycle, 34 min. Used 6.6 gal. of hot water. Performance: dishes and silverware, fair. Relatively noisy in operation.

RCA Whirlpool, Model DDW240 (Whirlpool-Seeger Corp., St. Joseph, Mich.) $290. A front-loading, under-counter model. Complete cycle, 34 min. Used 6.2 gal. of hot water. Performance: dishes, fair to good; silverware, fair. Relatively noisy in operation.

Westinghouse, Model DWDA-24 (Westinghouse Electric Corp., Columbus 16, Ohio) $300. A drawer-type, top-loading, under-counter model. Complete cycle, 80 min.; cost of operation was much higher than average because of long cycle time. Used 7.8 gal. of hot water. Performance: dishes, fair; silverware, fairly good.

* * *

James Universal, Model 9900 (Cribben & Sexton Co., Universal Gas Appliances, Chicago 12) $280. A top-loading, portable model. Wash cycle only, 14 min. Dishes were air dried; cost of electricity for operation was therefore about ¼ as much as average of other makes. Used 6.0 gal. of hot water. Performance: dishes and silverware, relatively poor.

Youngstown, Model DW300 (Youngstown Kitchens, Div. of American-Standard, Warren, Ohio) $300. A front-loading, under-counter model. Capacity, much above average. Complete cycle, 36 min. Used 7.2 gal. of hot water. Performance: dishes, poor; silverware, fair.

▶ **REF:** Bulletin, Aug. '57+++, Feb. '58+++.

GAS AND ELECTRIC RANGES
and built-in cooking units

The consumer who is about to replace or buy new cooking equipment must make several basic decisions before making a purchase. First, she must decide whether she will cook and bake with gas or electricity, if both are available for her use, and then make a choice between a free-standing or a built-in installation. While there is not likely to be any great difference in purchase price between similarly equipped and constructed gas and electric cooking appliances, the cost of installation, often high for electricity, may often be a determining factor. In most areas, gas is less expensive to cook with than electricity. Note, however, that an electric range does not heat a kitchen as much in hot weather because it uses its "fuel" more efficiently. The broiler of an electric range will usually give somewhat faster broiling action than the broiler of a gas range.

Correct adjustment of a gas burner is very important. The flame from each tiny hole of a burner should be blue in color with a distinct outline. If the flame wavers or is not sharply defined, there is too much gas in the mixture. If the flame is not "smooth" or tends to sputter, there is probably an excess of air. If your burners need adjustment, notify the gas company or your dealer at once.

An improperly adjusted burner is not only inefficient in use of gas and therefore costly to operate, but may present a serious hazard of carbon monoxide poisoning. The danger is especially great with an oven burner, and in a small, poorly ventilated kitchen. It is wise to connect a gas range or oven to an outside flue so that the products of combustion—water vapor and gases—will be safely removed from the house. If it is not so connected, keep a window open at all times the stove is in use.

An electric range may present both shock and fire hazards. A modern gas range, besides both these risks, may (because of the fuel used) cause asphyxiation or explosion. Some of the newer gas ranges have features which offer some help in eliminating the leakage of unburned gas.

Special features and accessories

As a general rule, a manufacturer will have only one basic design for a particular size of range in his line. In construction *and performance of basic cooking operations,* the less expensive model is fully the equal of the most expensive one. But the price goes up with the number of added features (which add little to utility of a range). Mrs. Consumer will therefore have to decide whether she wants a high-speed burner, a griddle, a window in the oven, two ovens or only one, a barbecue broiler or "rotisserie," a new thermometer device to turn the oven off when her roast is done, deep-well cooker, controlled-temperature surface burners, and a host of other available "extras."

Push-button control, which has been available on electric ranges for several years, has recently been announced as available on at least one gas range.

The apartment-size or 30-inch range is becoming increasingly popular. Although lower in price, it has all the essential cooking and baking qualities of larger ranges, and in many instances a larger rather than smaller oven, and the saving in price can more than pay for conveniently located storage space and work surfaces which the smaller stove lacks.

Built-in burners and ovens

There is little doubt that built-in equipment contributes a "modern" look to a kitchen. Consumers' Research feels that any homemaker would be well advised to consider objectively, before buying, the relative merits of built-in cooking appliances as compared with conventional ranges. Waist-high placement of the oven and the fact that oven and burners can be separately located in the most desirable places are undeniable advantages for many. However, in homes where the oven and broiler are much used, the separate arrangement may prove to be actually less desirable than a conventional range or built-in units placed close together.

The new and "efficient" appearance of the built-in oven and range-top appliances does not, as one might suppose, provide faster cooking or baking and more efficient use of gas or electricity than the usual kitchen range. Indeed, from the standpoint of quality or speed of cooking, built-ins offer no advantage at all. Several manufacturers, in fact, who make both ranges and built-in units use similar or identical burners on them. Consumers' Research found that there was no consistent difference in cooking efficiency between the burners employed on regular gas ranges tested and those used in built-in counter-top units.

In general, built-in units cost a good deal more than a range when the cost for installation is considered. Installation of separate units in a new home may cost several hundred dollars more than putting in a conventional range. It should be noted, however, that the cost of built-in appliances can usually be included in the new home mortgage while a free-standing range and other movable appliances cannot. Conversion of an existing single unit installation to a separate oven and counter-top arrangement, involving as it usually does a rather extensive kitchen remodeling job, is never inexpensive; it may easily cost several thousand dollars.

Several studies have been made to determine the proper height for a built-in oven. In one report, it was generally agreed that the distance from the kitchen floor to the bottom of the baking and roasting compartment of a built-in oven should be about 34 inches for persons between five feet two inches and five feet five inches in height.

Electronic ovens which offer high-speed cooking to the housewife (a steak can be cooked in three minutes, for example) are not likely to find many purchasers for several years. Their cost is very high—Tappan sells their model for about $1200—and they have certain definite disadvantages. There is only a limited browning and crusting of surfaces with electronic cooking on those foods which are cooked in a short time. If the element required for browning these foods is turned on, one loses the advantage of the cool container and cool oven which is one of the two major selling points. Note, too, that china, glass, or paper cooking utensils must be used because the radio waves that do the cooking cannot penetrate metal pots and pans. Electronic ovens do have their place in commercial establishments.

In recent years, manufacturers of both gas and electric cooking appliances have made frequent design changes involving an increased rate of energy input to top burners. Present typical figures for "giant" burners are 12,000 Btu per hour (gas), or 2000 watts (electric). These values, which offer about the same amount of heat when efficiencies are considered, are entirely sufficient for surface burners; added speed (new "fast-heating" elements are rated at about 18,000 Btu per hour and 2600 watts, respectively) is a talking point, chiefly, and of no great value. Indeed, there is a question as to what extra-fast heat input will do, in time, to cooking utensils and to the range top itself.

Installation

There are certain safety precautions which must be taken in installing any cooking appliance. Top burners, for example, must be located at safe distances from combustible materials. It is important, therefore, that you personally see to it that the manufacturers' instructions for installation be followed with the greatest care and attention.

It is recommended that a vertical clearance of 36 inches or more be maintained between a cooking top and any combustible construction materials. If the underside of such combustible construction is protected with asbestos millboard at least one-quarter inch thick covered with sheet metal of not less than No. 28 U.S. gauge, the distance may be decreased, but should be not less than 24 inches. Practically, this requirement eliminates wooden cupboards or shelving above any range or counter-top burners, and CR feels that the spaces above these units are best left unused. A range top should be at least 18 inches horizontally from a curtained window (it is best *not* to curtain any kitchen window that is near a range or oven).

It is a good idea to install a vented hood or an exhaust fan or both at a proper height above surface burners so that cooking odors, smoke, grease-carrying vapors, and heat are quickly removed from the kitchen. CR advises at least three to four feet separation between a gas range top and the bottom of an exhaust fan. A fan and its housing should be inspected frequently (at least twice a year) and thoroughly cleaned if needed. Do not allow grease or dirt to accumulate.

Hints on buying

Some general rules for selecting any cooking appliance follow:

1. Switches or controls should be conveniently placed (preferably on the backsplash but not behind the cooking area, where one's hand or arm might be burned while reaching for them). Controls at an exposed position should have locking arrangements to prevent their being turned on accidentally. Controls should also be clearly marked and so designed that the "Off" position is readily discernible from at least a 10-foot distance.
2. Fuses and lights for illumination and indication of control positions should be replaceable easily from the front.
3. Oven racks should be easy to move and steady, *with rods close together* (less than 1¼ inches).
4. Storage drawers should operate smoothly (steel or nylon rollers are preferred), and should be easily removable for cleaning.
5. There should be full-size, fairly deep, drip trays below the burners to catch spill-overs.
6. A gas appliance should not be purchased unless it bears the A.G.A. seal of approval. An electric appliance should have the *UL* label.
7. It is quite important that top burner grids be level when installed, so that cooking utensils placed on them will be level. Otherwise fats used in frying will flow toward the low side of the pan, making this cooking operation difficult or unsatisfactory.

Tests on 1958-model electric ranges are now in progress; a report is planned for a fall BULLETIN.

In the abbreviated listings which follow, the presence of certain features on the model tested is indicated by symbols in parentheses immediately following the price information. A—automatic oven ignition; C—clock-controlled oven operation; S—separate simmer burners (one or more); T—controlled-temperature top burner.

Evenness of heat distribution in all oven-type gas broilers tested, in both ranges and built-in ovens, as ascertained by toasting bread on the broiler pans, was only poor to fair. The broiler in the *Chambers 42-4BB* counter-top unit, however, produced fairly even toasting.

Gas ranges

Ratings are cr56.

A. RECOMMENDED

Tappan, Model S-75 (The Tappan Stove Co., Mansfield, Ohio) $140. Top burner and oven performance, above average. Controls, good. Construction quality, somewhat below average. 1

Maytag Dutch Oven, Model 214 CPAW (The Maytag Co., Newton, Iowa) $320. (A,S) Top burner performance, very good. Oven performance, fair. Controls and construction quality, very good. 2

Caloric Ultramatic, Model CPW-9-B4-U-RXTS (Caloric Stove Corp., Topton, Pa.) $377. (A,S,T) Top burner performance, average. Oven performance, somewhat above average. Controls, fairly good. Construction quality, very good, except broiler door too near floor when open and bottom of rotisserie not removable for cleaning (because of interference by wiring). 3

Chambers, Model 61-90C (Chambers Built-ins, Inc., Chicago 35) $500. Top burner performance, average. Oven performance, somewhat above average. Controls, fairly good. Construction quality, good. 3

Magic Chef, Model 1A-683 (Magic Chef Inc., St. Louis) $350. (A,C,S,T) Top burner and oven performance, somewhat above average. Controls, fair. Construction quality, generally good, but broiler door too near floor when open, and oven racks relatively light. 3

B. INTERMEDIATE

Detroit Jewel, Model A412U (Detroit Division, Welbilt Corp., Detroit 31) $200. (S) Top burner and oven performance, average. Controls, fair. Construction quality, somewhat below average. 1

Florence Custom Deluxe, Model G-64068 (Florence Stove Co., Lewisburg, Tenn.) $230. Top burner performance, above average. Oven performance, below average. Controls, fair. Construction quality, fairly good. 1

Montgomery Ward, Model DF-2646-A (Montgomery Ward & Co., Chicago) $200, plus freight. (A,S) Top burner performance, below average. Oven performance, average. Controls, fair. Construction quality, good. 1

Welbilt DeLuxe, Model 56910 (Welbilt Corp., Maspeth 78, N.Y.) $165. Top burner and oven performance, about average. Controls, good. Construction quality, fair. 1

Kenmore Twin Oven (Sears-Roebuck's Cat. No. 1707) $210, plus freight. (S) Top burner and oven performance, about average. Controls, good. Construction quality, generally good. 2

Norge, Model G-346U (Norge Division, Borg-Warner Corp., Chicago 54) $250. (A,C,S) Top burner performance, average. Oven performance, somewhat below average. Controls, fairly good. Construction quality, generally good. 2

Roper, Model 74A44 (George D. Roper Corp., Rockford, Ill.) $453. (A,C,S,T) Top burner and oven performance, about average. Controls, good. Construction quality, generally good. 3

Built-in gas ovens

Ratings are cr57.

A. RECOMMENDED

Chambers, Model 1W (Chambers Built-ins, Inc., Chicago 35) $280 or $320, depending upon finish. (A) Baking oven only; no broiler. Construction, very good. Time to preheat, longer than average. Performance, good. Has "Dutch oven" feature in which a vent closes so that oven retains sufficient heat for a time for some baking functions after gas is turned off. 3

Roper, Model 530KA (George D. Roper Corp., Rockford, Ill.) $280 or $290, depending upon finish. (A,C) Construction quality, good. Performance, good. 3

B. INTERMEDIATE

Kenmore, Model 834.5260 (Sears-Roebuck's Cat. No. 1772) $170 retail; $155, plus freight, in catalog. (A,C) Construction quality, good. Performance, generally good, but uniformity of temperature distribution, below average. Internally, almost identical to *Florence 153108*, and test results were generally similar. 1

Caloric, Model CP-CW-MC-X (Caloric Stove Corp., Topton, Pa.) $198. (A) Construction, very good. Performance, average. 2

Florence, Model 153108 (Florence Stove Co., Chicago 54) $176. Construction, good. Performance, generally good, but uniformity of temperature distribution, below average. Very much like the *Kenmore 834.5260*. 2

Magic Chef, Model 4A-21 (Magic Chef, Inc., St. Louis 10) $180 or $190, depending upon finish. (A) Construction, good. Performance, average. 2

Counter-top gas cooking units

Ratings are cr57.

A. RECOMMENDED

Kenmore, Model 834.5760 (Sears-Roebuck's Cat. No. 1778) $65 retail; $60, plus freight, in catalog. Four burners. Construction, good. Performance, above average. 1

B. INTERMEDIATE

Caloric, Model BR4-T (Caloric Stove Corp., Topton, Pa.) $129. (S,T) Four burners. Construction, good. Controls, poor. Performance, average. 2

Florence, Model A124108 (Florence Stove Co., Chicago 54) $104. (S) Four burners. Construction, good. Controls, poor. Performance, average. 2

Roper, Model 540TC (George D. Roper Corp., Rockford, Ill.) $102. (S,T) Two burners. Construction, fairly good, although the cabinet space required was much greater than average (the shell was 11¼ in. high). Controls, fairly good. Performance, average. 2

Chambers, Model 24-4GC (Chambers Built-ins, Inc., Chicago 35) $180 or $200, depending upon finish. Four burners. For installation on top of a low counter (i.e., not built in). Construction, very durable. No drip trays. Controls, good. Performance, average. 3

Chambers, Model 42-4BB (Chambers Built-ins, Inc.) $330 or $360, depending on finish. Four burners and broiler-griddle. For installation on top of a low counter. Controls, fairly good. Performance of surface burners, average. Evenness of heat distribution in broiler, above average. 3

Tappan, Model TNS-5-3 (Tappan Stove Co., Mansfield, Ohio) $165. (S) Four burners. Construction, good. Controls on top at front (a position in which they are not readily accessible to the prying fingers of young children) were subject to spattering from frying foods. Cabinet space required, much greater than average; the shell was 10½ in. high. Performance, average. 3

C. NOT RECOMMENDED

Magic Chef, Model 3A-20 (Magic Chef, Inc., St. Louis 10) $55 or $65, depending upon finish. (S) Two burners. Construction, unsatisfactory. Top was not flat and as a result pans could not be set level. (The rating would otherwise be *A. Recommended.*) Controls, fairly good. Performance (thermal), above average. 2

Welbilt, Model 523 (Welbilt Corp., Maspeth 78, N.Y.) $255 complete for two two-burner surface units and *Model 5030* oven. Construction, fair. Rear burner grid was not flat, and flat-bottomed pots and pans wobbled when placed on it. Porcelain top was warped. Controls, good. Performance, average. 2

▶ **REF:** BULLETIN, Nov. '56+++, Mar. '57+++, Apr. '57+++.

REFRIGERATORS

Nearly all makes of refrigerators are now available in various colors as well as white, but there are some disadvantages that go with colors other than white. Colorful exteriors, unusual shapes, and novel fitments have little effect on a refrigerator's usefulness in convenient preservation of foods. Some features which would be considered advantageous to some families, for example, built-in cold-drink dispensers or freezer sections located at the bottom instead of the top, would be a disadvantage to others. (Some of the newer features are practical and useful, such as flush-to-the-wall design.) The shelf rods or bars should be flat and closely spaced, so that narrow containers are not likely to tip over. Shelves in the door, if any, should be deep enough to be really useful. The door handle should be of such design that the door can be opened by a person whose hands are full. One or more of the shelves should be adjustable to accommodate unusually large items, when necessary. Most important, the temperature in the freezer space should be low enough (see "Refrigerator-freezers") to keep frozen food properly without need to keep the rest of the box below 39 degrees.

The "de luxe" model may be much higher in price, to provide fancy trim, automatic defrosting, special shelf arrangements, and "gadgetry." However, the standard model will likely have exactly the same essential mechanism and efficiency as a "de luxe" model of the same make at $100 more.

Defrosting

Automatic or semiautomatic defrosting of refrigerators is now common; however, it is not cheap, for it usually adds about $50 to the price of a refrigerator. Three methods of defrosting automatically are commonly used:

1. An electric heating coil built into the wall of the cold-producing element.
2. The hot gas method, in which heat given off by the refrigerant during the condensing cycle is passed back into the evaporator coils.
3. Moisture in the box is collected as frost on a refrigeration plate located in the storage space. This plate defrosts during the "off" part of each cycle.

With all three methods, the water produced by defrosting is collected in a receptacle. In some cases this must be emptied periodically; in others, the flow of defrost water is piped to a shallow tray under the compressor motor where the warmth evaporates it.

Safety doors

Many children have been suffocated while trapped in refrigerators. A federal law now requires that all household refrigerators that are shipped in interstate commerce after October 30, 1958, must be equipped with a safety device permitting the door to be opened from the inside. Two refrigerators in CR's latest test could be opened from the inside, but there was doubt whether a young child would surely be able to escape from either if trapped inside.

The door of the *General Electric* was held shut by a magnet instead of a latch, and it could be opened by pushing from the inside if sufficient force could be exerted. *Admiral* refrigerators were equipped with a latch which could also be operated from the inside. Psychological tests have shown that some children may make no attempt to escape if locked in. The only sure safeguard will be to remove the door, as some state laws require, before discarding any refrigerator or leaving it empty and unused.

CR's tests

The "pull-down time," as shown in the listings, is the time taken by each refrigerator to bring the temperature of the general storage space from 110°F to an average of 46°F in a room at 110°F. A short time per cubic foot indicates good refrigerating capacity. Monthly operating costs have been calculated on a basis of 3½ cents per kilowatt-hour with the refrigerator set to give an average food chamber temperature of 39 degrees.

Ratings are cr56.

B. INTERMEDIATE

Admiral, Model DA-1110 (Admiral Corp., Chicago 47) $220. ($21.80 per cu. ft.) Capacity: total, 10.1 cu. ft.; freezer space, 1.8 cu. ft. Pull-down time, 6.1 hr., longer than average. Temperature in the frozen food compartment, 20° (too high). Cost of operation, $1.80 per month (18c per cu. ft.), avg. Semiautomatic defrosting, which CR considers the best type, was satisfactory. During the defrosting period (about 30 min.), temperature in the freezer compartment rose to about 55°; however, with the push-button type, the housewife can remove the frozen food to the general storage space during defrosting without significant thawing of the food. 1

GE, Model LB 10NB (General Electric Co., Louisville 1, Ky.) $230. ($23.50 per cu. ft.) Capacity: total, 9.8 cu. ft.; freezer space, 1.1 cu. ft. Pull-down time, 2.6 hr., good. Temperature in the frozen food compartment, 20° (too high). Cost of operation, $1.75 per month (18c per cu. ft.), avg. ¶New *Model LB 10R* appears similar. 1

Frigidaire Super, Model S-121-56 (Frigidaire Division, General Motors Corp., Dayton 1, Ohio) $311. ($25.70 per cu. ft.) Capacity: total, 12.1 cu. ft.; freezer space, 1.2 cu. ft. Manual defrosting. Pull-down time, 3.3 hr., good. Temperature in the frozen food compartment, 18° (too high). Cost of operation, $2.45 per month (20c per cu. ft.), average. 2

Kelvinator, Model K44F-11-R (Kelvinator Division, American Motors Corp., Detroit 32) $290. ($27.40 per cu. ft.) Capacity: total, 10.6 cu. ft.; freezer space, 1.5 cu. ft. Manual defrosting. Pull-down time, 3.7 hr., somewhat longer than normal. Temperature in the frozen food compartment, 20° (too high). Cost of operation, $1.60 per month (15c per cu. ft.), lowest of all refrigerators tested. ¶New *Model K43H-11* appears similar. 2

Kelvinator, Model K46F-11S-R (Kelvinator Division, American Motors Corp.) $340. ($32 per cu. ft.) Capacity: total, 10.6 cu. ft.; freezer space, 1.5 cu. ft. Essentially the same as *Kelvinator Model K44F-11-R,* except equipped with semiautomatic (push-button) defrosting. Pull-down time, 3.2 hr., about average. Temperature in the frozen food compartment, 19° (too high). Cost of operation, $1.65 per month (16c per cu. ft.), low. ¶New *Model K45H-11* appears similar. 3

REFRIGERATOR-FREEZERS

The most important differences from the consumers' standpoint between refrigerators and combination refrigerator-freezers are that the combination units are much higher priced and most of them cost substantially more for electricity to operate; on the other hand, they do provide for much better storage of frozen food, for they give freezer temperatures close to zero. Quality losses in frozen food are held to a minimum if frozen food is stored at 0°F. Even in foods that remain frozen, and feel solid, deterioration of quality and flavor will occur at a markedly faster rate at 10° and higher.

Combination refrigerator-freezers were originally made with two separate sets of cooling coils and controls so that the freezer and refrigerator sections were independent of each other. Today's combination units can be readily distinguished from common electric refrigerators only by the fact that the freezer sections are walled off and insulated from the refrigerator spaces.

The average purchase price of the refrigerator-freezer combinations tested by CR was $38 per cubic foot of claimed storage space compared to $28 per cubic foot for refrigerators; the average cost for electricity for the combinations was about 40 percent higher than for the refrigerators; and the average temperature in the freezer was 2.5 degrees for the combination appliances compared to 16 degrees in the freezer chamber of the refrigerators. Which kind to buy will, of course, depend upon the requirements of the individual home, as to the amount of frozen food likely to be stored and used, and the time it will be kept. A freezer is a dubious purchase in any place where long power outages are a possibility.

Automatic defrosting

All of the combination units included in CR's tests had separate freezer sections; these were not automatically defrosted. All used the plate type of automatic defrosting of the refrigerator section (see "Defrosting," page 8), which was satisfactory. Automatic defrosting is not really necessary for a separate freezer section, since frost forms relatively slowly there and defrosting is necessary only a few times a year. Perhaps a "wait-and-see" attitude would be warranted on refrigerator-freezers for which "no defrosting" claims are made.

Capacity

Because of the odd shapes of some freezer spaces and sizes of frozen food packages, Consumers' Research found that from 20 to 55 percent of the manufacturer's claimed space was unusable. If a refrigerator-freezer is selected on the basis of the manufacturer's claims of freezer space, the consumer may often be disappointed. Sliding wire baskets, though a convenience in loading and unloading freezer space, take up a considerable amount of valuable room.

Operating costs and freezer temperatures are based on tests with the controls set to give a refrigerator space temperature of 39 degrees with room temperature at 90 degrees. Costs are calculated at 3½ cents per kilowatt-hour.

* * *

Tests of more recent models of combination refrigerator-freezers are reported in the August 1958 BULLETIN.

Ratings are cr56.

A. RECOMMENDED

Philco Automatic, Model L-1164 (Philco Corp., Philadelphia) $330. ($31.40 per cu. ft.) Rated volume, 10.5 cu. ft. Actual freezer space, 1.8 cu. ft. Satisfactory, and economical to operate, but interior arrangement of the freezer was judged to be not as convenient as in some other makes. Operating cost, $2.45 per month (23c per cu. ft.). Pull-down time, 3.2 hr. (0.3 hr. per cu. ft.). Average temperature in freezer, 3°. ¶New *Model RS1183* appears similar. 2

Admiral Dual Temp, Model CU1205P (Admiral Corp., Chicago 47) $450. ($40.90 per cu. ft.) Rated volume, 11.0 cu. ft. Actual freezer space, 2.8 cu. ft. Well-designed box, easy to clean. Operating cost, about average, $2.80 per month (26c per cu. ft.). Pull-down time, 3.9 hr. (0.35 hr. per cu. ft.), somewhat longer than average. Average temperature in freezer, 4°. This refrigerator-freezer is equipped with a phosphorescent latch knob inside so that in some instances a child trapped inside could open the door from the inside. 3

Amana Stor-Mor, Model FPR 14-1 (Amana Refrigeration, Inc., Amana, Iowa) $600. ($43.50 per cu. ft.) Rated volume, 13.8 cu. ft. Actual freezer space, 6.1 cu. ft. An excellent appliance for those who require a large freezer space. Operating cost, $4.25 per month (39c per cu. ft.) Pull-down time, 2.3 hr. (0.17 hr. per cu. ft.); best in this respect of all combination refrigerator-freezers tested to date. Average temperature in the freezer, 3°. 3

B. INTERMEDIATE

Frigidaire Imperial Cold-Pantry CP-120-56 (Frigidaire Division, General Motors Corp., Dayton 1, Ohio) $510. ($42.50 per cu. ft.) Rated volume, 12.0 cu. ft. Actual freezer space, 1.5 cu. ft. (small). Operating cost, high, $4.10 per month (34c per cu. ft.). Pull-down time, 4.7 hr. (0.39 hr. per cu. ft.), longer than average. Temperature in freezer, 2°. The ice ejector failed to work after a very short time. Fan which circulates cold air is of doubtful value, as increased air circulation tends to dry out foods. ¶New *Model CP-123-58* appears similar. 3

General Electric LH-14N (General Electric Co., Appliance Park, Louisville 1, Ky.) $580. ($42.30 per cu. ft.) Rated volume, 13.7 cu. ft. Actual freezer space, 2.7 cu. ft. Operating cost, about average, $3.70 per month (27c per cu. ft.). The average temperature in the food storage section at the coldest setting of the control was too high (would not go below 42°). Pull-down time, 4.9 hr. (0.36 hr. per cu. ft.), longer than average. Temperature in freezer, 2°. Has three revolving shelves, which waste some space but are very convenient in use. ¶New *Model BH 13R* appears similar. 3

HOME FOOD FREEZERS

Food freezers may have their place in certain households. The consumer who buys one in the belief that he will save enough on food purchases to pay for the freezer, however, will soon come to be disillusioned. A freezer is a convenience—if you like and are sure you will continue to like frozen meats and other frozen foods—in that it permits the consumer to take advantage of special sales and to make certain sufficient food is on hand when unexpected guests arrive. The cost of operating a food freezer is likely to be 10 cents to 30 cents per pound for freezing and storing the food (not including costs of wrapping and packaging).

Before buying a freezer, consider its location; are the door openings, width of stairs, etc., large enough to permit bringing the freezer in? The most convenient place for the use of the freezer is in the kitchen. Be sure that the floor is strong enough to support a fully loaded freezer. If the freezer is to be located in an unheated space, check with the manufacturer to ascertain if his appliance can be operated satisfactorily at low room temperatures. Other points to consider before buying a freezer are: permanence of your location (moving a loaded freezer to another house can be difficult and expensive), and the likelihood of electric power being shut off by storm damage for 12 hours or more.

Upright freezers are somewhat more convenient to load and unload and are easier to clean and defrost, but require defrosting more frequently. Frost should be scraped off when it gets to be ½ inch thick; do not defrost with hot water. To prevent food that is removed from the freezer from thawing too quickly during the defrosting operation, turn the cold control of the freezer to its coldest setting the night before defrosting. Do not assume that as long as the food is frozen hard it is in good condition and retains full flavor and palatability. Actually, some frozen food deteriorates rapidly; a rise in temperature to 5 degrees means that deterioration will proceed at 2 to 3 times its rate at the desirable zero temperature. Some foods, if not used with reasonable promptness, deteriorate to a degree that will make them almost inedible or possibly even unwholesome.

Operating costs differ widely among the various brands; however, the upright type is likely to be slightly more expensive to use than the chest-type freezer.

Frozen food plans

It is rarely sound policy to buy a freezer with a year's supply or any large amount of frozen food. Those who have signed a contract for such plans without reading the fine print have often found that they were getting no bargain at all and that it was difficult or impossible to obtain redress. In New York, one plan charged $600 for a freezer worth $235, collected $94 in finance charges, and, of course, did not provide food at 30 percent savings as promised.

Salesmen quote low prices for meats without indicating that the low price applies to the whole quarter of beef, including a great quantity of less desirable cuts. Often, because of losses in trimming, the net price per pound will come out much higher than claimed; equally important, the cuts of meat will not be those that the customer would choose to buy for himself.

Judgment of refrigerating capacity is based on the time required by the freezer to pull down storage space temperature from 110°F to 0°F.

Operating cost is estimated for a month on the basis of electricity at 2 cents per kilowatt-hour, instead of 3½ cents as for refrigerators, because homes with freezers are likely to have many other appliances and thus use enough electricity to get the cheaper rate. The figures in parentheses, following the prices and costs of operation, permit comparison on a per-cubic-foot basis. Capacities given are those actually measured by CR. Ratings are cr54, except as noted. (Freezer designs and performance are fairly stable, tend to continue in their essentials for some years.)

Chest-type freezers

A. RECOMMENDED

Hotpoint, Model EK152-7 (Hotpoint Co. Division, General Electric Co., Chicago 44) $480. ($31.60 per cu. ft.) Height closed, 37⅛ in. (with lid open, 63¼ in.); length, 60 in.; width, 33 in. Capacity, 15.2 cu. ft. Refrigerating capacity, satisfactory. Cost of operation, $1.80 (11.8c). ¶*Model 7FK17* (about the same outside dimensions, but 17.2 cu. ft. rated capacity) appears to be essentially the same.

B. INTERMEDIATE

Ben-Hur, Model 1356 (Ben-Hur Mfg. Co., Milwaukee 12) $400. ($30.30 per cu. ft.) Height, 36 in.;

length, 53 in.; width, 27½ in. Capacity, 13.1 cu. ft. Refrigerating capacity, somewhat poorer than average. Cost of operation, $2.10 (16c). cr57

C. NOT RECOMMENDED

Philco, Model H-1335 (Philco Corp., Philadelphia 34) $400. ($30.75 per cu. ft.) Average temperature inside freezer was too high, and there was no provision for colder settings.

Upright freezers

A. RECOMMENDED

Amana, Model 12F (Amana Refrigeration Inc., Amana, Iowa) $400. ($33.90 per cu. ft.) Height, 65¼ in.; width, 32⅝ in.; depth, 26¾ in. Capacity, 11.8 cu. ft. Refrigerating capacity, very good. Cost of operation, $2.10 (17.8c). ¶Would be rated *B. Intermediate* for those who would consider the relatively high operating cost too much to pay for superior performance in rapid freezing of heavy loads of food. ¶New *Model 12J* appears similar. cr55

Amana, Model 15A (Amana Refrigeration Inc.) $550. ($36.50 per cu. ft.) Height, 65¼ in.; width, 32¼ in.; depth, 30⅞ in. Capacity, 15.1 cu. ft. Refrigerating capacity, very good. Cost of operation, $2.40 (15.9c). ¶New *Model 15C* appears similar. cr56

General Electric, Model HU-11L (General Electric Co., Bridgeport 2, Conn.) $383. ($32.75 per cu. ft.) Height, 64⅜ in.; width, 34⅛ in.; depth, 29⅜ in. Capacity, 11.7 cu. ft. Refrigerating capacity, satisfactory. Cost of operation, $1.40 (12c). ¶New *Model HU-11R* appears similar.

HOUSEHOLD GARBAGE AND TRASH DISPOSAL

Disposal of household waste can be a real problem, particularly where there is no municipal garbage collection. There are four methods of garbage disposal available. These are the garbage grinder which is installed in the sink; the electric or gas-fired incinerator which requires connection to a chimney; the outdoor incinerator; and an outdoor container in which garbage decomposes slowly. None of these devices will dispose of cans, bottles, etc. Incinerators may not be permitted in localities where smog is a problem.

Some cities prohibit use of garbage grinders because of the extra load they put on municipal sewage systems. A disposer unit should not be used with a cesspool. Use of one with a private septic tank may be questionable if the tank does not have at least 50 percent larger capacity than would otherwise be required.

New tests of garbage disposer units have not been made as subscribers have shown little interest in this subject, and the appliances have certain disadvantages in practice.

Incinerators for use indoors

B. INTERMEDIATE

Calcinator Automatic Home Disposal Unit (Calcinator Div., Valley Welding & Boiler Co., Water at 27, Bay City, Mich.) Gas and electric models, $114.50 to $154.50, f.o.b. factory, plus federal excise tax for electric models. Capacity, 1.6 bushels. ¶Newer electric model, at $99.95, not tested.

Incinor Gas-Fired Incinerators (Bowser, Inc., Incineration Div., Sycamore at 42, Cairo, Ill.) $79.50 to $353, f.o.b. factory. Available in 2-bushel and 4-bushel sizes. Fired on an intermittent basis as required.

▶ **REF:** Bulletin, Aug. '52.++

Garbage disposal device, outdoor

A. RECOMMENDED

Bard-Matic (Bard-Matic Corp., Box 266, Muskegon, Mich.) $39.95. The *Bard-Matic* will need to be relocated periodically, approximately once a year, depending upon climate, amount and types of garbage, and other factors.

Trash burners for use outdoors

Ratings are cr56.

A. RECOMMENDED

Blitz-Burner (Lakeshore Mfg. Corp., National Bank Bldg., Ludington, Mich.) $14.95, plus freight. Well designed, effective, and tentatively judged the best of all the present known means of burning papers and combustible rubbish out of doors. Not for garbage. Amount of rusting indicates life of not more than 2½ yr. (less near the coast). Has important advantages in minimizing fire risk and in keeping accumulated papers and trash dry by protecting them from rain and snow.

B. INTERMEDIATE

Alsto Saf-T-Brn, Model PB (Alsto Co., 4007 Detroit Ave., Cleveland 13) $24.95, postpaid. Pyramid shape, 24 in. square at base, 38 in. high. 3-bushel capacity.

C. NOT RECOMMENDED

Iron Horse Combustionair B7 (Rochester Can Co., Inc., 100 Greenleaf, Rochester 9) $7.95.

Television

Servicing • buying a receiver • ratings of 17 models, including portables • indoor and outdoor antennas

TELEVISION—CURRENT TRENDS

Portable receivers with 17-inch viewing screens and table models and consoles with 21-inch screens made up the bulk of 1957 sales of TV receivers. The only important development in the TV industry during the past year was a new wide-angle or 110-degree picture tube. This new tube provides a picture equivalent in area to that of the older and commonly used 90-degree tubes, but because of a reduction in length, manufacturers are able to slice five or six inches off the rear of a cabinet. Many even eliminate the now familiar projection at the rear of the cabinet in which the neck of a 90-degree tube was often housed. One of the new receivers may thus be placed close to a wall and not extend as far into the room as older sets did.

Several manufacturers this year followed a trend of employing a motor-driven tuner by which channels are changed merely by touching or tapping a small panel at the front of the set. In this class, too, are the many varieties of remote controls, which enable one to sit back in an easy chair and change channels. Both touch tuning and remote control are added and unnecessary complications, but will no doubt have appeal to many as intriguing novelties. If you are willing to pay for such automaticity, needed by only very few crippled or invalid persons, there are other controls, too, which provide remote control of the volume level of the sound, and turn the set on or off as well. All will work, but because of the added complication of such gadgets, any TV set buyer will be wise to make sure the set can be tuned manually in the event something goes wrong with one of the devices.

With the known exception of Zenith, most TV manufacturers use "printed circuits" and vertical chassis, which, contrary to expectations, seem to make a receiver more difficult to service. Design changes are principally of a kind which enable a manufacturer to maintain a favorable competitive price as wages and other costs rise. Generally, however, CR has found that the performance of the offerings for the past two years have been inferior to models tested in the 1954-1956 era. The so-called special features are of great benefit to the advertising departments which have to exploit and sell television, but have not provided improved performance for the consumer.

NEW DEVELOPMENTS in TV broadcasting

Probably the most important happening during the year concerned "pay television" (as contrasted with "free television" furnished and paid for by advertising sponsors). Late in 1957, the Federal Communications Commission decided finally to authorize tests, and indicated it would accept applications from interested broadcasters, up until March 1, 1958. This announcement set off powerful opposition in Congress, however, and the House Commerce Committee stepped in with a resolution asking the F.C.C. to delay granting of licenses to stations at this time.

Conservative estimates indicate it may now be two years or more before final action is taken and a decision made. If and when pay TV comes, it is to be expected that a decoding device of some sort will be used at the receiver to unscramble the picture upon deposit of coins, or a decoding signal will be sent out by the local telephone company. In the latter method, the monthly phone bill would include charges corresponding to the number of programs selected. No matter how it is done, the viewer will have to pay for those programs he wishes to see which are not freely broadcast, and it is the viewer, too, who will thus make the final decision as to success or failure of pay TV.

COLOR TELEVISION

There is much room for improvement in transmission and reception of color TV. The quality of transmission of some colorcasts is, at best, mediocre — the broadcast of the 1957 World Series was an example. Not only is the color picture poor at times, but providing for color causes the picture to be of poor quality when received on a black-and-white set. Conversely, a black-and-white transmission of good quality may be poorly received by a color set, simply because the color set is not perfectly adjusted (color sets seldom are).

One company, RCA, continues to push the sale of color TV receivers. But with all the effort put forth in this direction the number of sets actually in use at this time is estimated at only 300,000 (less than one percent of the total TV sets in use). Initial cost of receiver ($500 and up, $400 and up with a trade-in), lack of good color programs, and need for frequent *and* expensive servicing are the principal deterrents to sales. The latter is a real cause, too, when one considers that an RCA service contract—$100 for the first year and $120 for the second year—are definitely to be recommended for all who purchase a color set.

CR's advice to the potential purchaser of a color set is to obtain a free home trial of the set first and then decide, on the basis of quality of the black-and-white picture and other performance factors of the color set, whether the set will be worth the large investment at this time.

Don't be tempted by carefully written advertisements for devices claimed to provide color reception on a black-and-white receiver through use of a so-called color "filter." Such a filter is not even the crudest substitute for a color set and *cannot* produce the same or even similar visual effects.

WATCHING TELEVISION

While one is watching television, the room should not be dark but lighted normally. Eyes may be strained in a dark room, or in one too brightly lighted. Lamps should be placed so that they do not come between the viewer and the TV receiver. The viewer should be comfortably seated at least four and preferably up to 10 times the picture width away from the set, with head erect, and should look slightly downward at the picture. If it is your custom to spend long periods watching evening programs, get up and move about occasionally and while sitting shift the position of your legs frequently. Rest the feet on a footstool or hassock. Prolonged viewing from a fixed position may cause thrombosis of the major leg veins. Formation of a blood clot in this way can present real danger to life, especially in older persons.

If glasses are required for normal distant vision, use them, but don't use sunglasses or other special viewing glasses unless they are prescribed by a competent oculist. If you are to drive at night after watching a TV program, give your eyes time to adjust to the far lower brightness outdoors (20 minutes may be required to make the adjustment from the TV screen brightness to normal room lighting).

A recent survey in England suggests that television viewing may affect adversely the vision of children in the age group between 11 and 14. Thus parents may well be justified in limiting the number of hours any child spends in watching TV programs. It is generally agreed that children should *not* sit or lie on the floor, as many do, and look upward at the TV screen.

TELEVISION SERVICING

Almost all new television sets carry a manufacturer's warranty of one year on the picture tube and three months on all other tubes and parts in the set. This warranty, however, does not include the labor or service work to replace these parts. In some isolated cases, the dealer himself may provide for a period of free service (as much as 3 months). It is doubtful whether nowadays the service contract is a necessity for a black-and-white television receiver, at least during the first year.

CR recommends that one of the well-known brands of picture tubes, such as *General Electric*, *RCA*, or *Sylvania*, be chosen as replacement, if replacement is needed. Reprocessed tubes, available at considerably lower prices, should be purchased only from servicing sources *known to be honest and reliable* who will give the same written guarantee as is available with new tubes of well-known makes.

Unless a person is experienced in electronics or electrical engineering, and is aware of the dangers that are present from the very high voltages, he should never remove the back cover from the TV set, for to remove this cover exposes the set owner and children who may be in the house to extremely dangerous high voltages that might easily cause death.

The numerous TV do-it-yourself books on the market may help determine what is wrong with the set if a tube or other major component is defective, but many are very remiss in not pointing up adequately the dangers of contact with high voltages. In some sets, plugging the wrong tube into a socket may cause under-chassis damage that will definitely require the services of a repairman, and his charges may be far more than the amount he would have charged to make the original repair.

There are many "gyp" TV servicemen, particularly in the larger cities; it is difficult to determine whether or not the serviceman who has been working on your set is honest until his bill has been rendered. If the bill is large, scrutinize it carefully. Make sure that all repairs and new parts are itemized on the bill and that everything claimed to be done was actually done and was needed. Typically, the "gyp" will pad his bill by charging for work he didn't do and for parts he didn't replace.

In the larger cities, too, the serviceman may be an impersonal operator, and interested only in one "killing" on each customer. Better Business Bureaus are investigating gyps in the TV and radio field and have on file lists of service dealers on whom they have had complaints regarding unfair or deceptive treatment. If you are doubtful about a particular service organization, check with your city's Better Business Bureau.

SAFETY

One area of a television set which cannot be 100-percent shielded is the metal chassis on which many metal parts are mounted. An electrically "cold" chassis is preferable and is usually present on those receivers in which a power transformer is employed to "light" the tubes and supply the required voltages. Such a transformer eliminates direct connection between the house power line and the chassis and other parts of the set. In many sets, however, which employ selenium, silicon, or germanium rectifiers, one side of the house power line is often connected directly or indirectly to the chassis of the receiver. Thus, depending upon the accident of position in the wall outlet of the plug on the extension cord to the set, the chassis may be at or almost at full line voltage. This latter method of connection presents a most dangerous condition if the chassis is not completely guarded against every contact with fingers, a bit of wire, or a bobby pin in the hands of an exploring infant. It is particularly dangerous on portable receivers, most of which use metal cabinets.

Under certain circumstances people can be and are killed when they accidentally touch a "live" set and a grounded pipe, radiator, or fixture at the same time. A little Chicago boy died last year because he touched a kitchen sink while at the same moment his ankle brushed against a metal cart on which a new portable receiver was in use. In another instance a small child was electrocuted when she touched the underneath part of a table-model receiver while crawling on a floor register located beneath the set. Never use a TV receiver with a metal cabinet or any set on a metal stand near water or heating pipes, registers, radiators, a lamp stand, or other metallic fixtures in the home.

Television cabinets are designed to permit adequate air circulation throughout the set and thus provide a needed cooling action. If this air circulation is cut off, as would likely be the case with an in-the-wall installation, for example, operation may be impaired and perhaps even a fire hazard created. For that reason, too, a set should never be located on or close to a radiator, hot-air register, or other source of heat.

BUYING A RECEIVER

It is correct to assume that a television receiver which is six to eight years old must be regarded as nearing the end of its expected useful life unless you are willing to pay for considerable repair work to keep it operating properly. Very likely, however, you have a wrong impression of the new model receivers if you believed all that was said in the ads, for most of the innovations stressed as unique in the advertising of a particular manufacturer are found on all or nearly all sets. Many of the points featured are likely to be unimportant or non-essential ones, mentioned in the advertisement for "sales appeal," primarily.

Almost all of today's receivers are very similar in basic design. The manner in which the various manufacturers execute that design, however, makes for significant variations in performance, need for and ease of servicing, and safety in use. These differences are not superficial and are not understood by dealers and salesmen; they are best evaluated by engineering tests and examinations. When possible, therefore, the wise purchaser will usually make a selection from one of the models tested and found satisfactory, or one that uses a similar chassis, unless he has access to really dependable information regarding the performance of another make and model. It should be noted that omission of a particular brand by CR is not to be construed as implying an unfavorable view of the make; the consumer should be aware, however, that there is some risk in buying a set of a private or department-store brand or a brand that is little known, or sells in a limited area only. Unfortunately, sales personnel, even in the most reliable stores, are seldom qualified to give the kind of advice the consumer can depend on. Their job is to sell sets, rather than to see that critical information on competing makes is made available to consumers (their commission increases with the price, and sometimes depends on the make sold).

We strongly advise that, if at all possible, you should arrange to make your final choice on the basis of reception in your own home. At the very least, take the time to watch fairly extensive demonstrations in the showroom of more than one dealer. Beware of exceptionally low prices, and free home demonstration offers, and above all do not sign anything before you actually purchase the set. The paper that you thought was a receipt may have been a note for the balance due on the receiver.

Many dealers and discount houses now sell television receivers at figures below their list price, and you should have no difficulty in purchasing a set at from 15 to 30 percent below the list price. Most such dealers do business on an ethical and fair basis. Some, however, are so-called "fast-buck" operators who can sell more cheaply because they take no responsibility for the set once it has been delivered. Indeed, they may not even provide delivery service, installation, and those final simple adjustments which are necessary in a home, in a majority of cases, for best performance. As few sets are properly adjusted at the factory, an independent service organization may have to be called in at a substantial fee to get the set in the best working order. And if the set doesn't function properly after adjustment, as happens at times with any receiver, you may be left "holding the bag."

We advise that if you are about to buy a used TV receiver, you should avoid any unknown or little-known brand. Don't buy any secondhand receiver unless you have had an opportunity to operate it freely, as long as you please, in the store or to try it in your own home. Don't expect too much from a secondhand receiver and don't spend too much when you buy. $40 to $75 is enough to pay for a 17-inch or 21-inch set which has likely been used four or more years. If the picture tube is near the end of its service, the expenditure for its replacement ($35 or more) may not be warranted. Always remember that in buying a secondhand set, especially if an old one or of little-known make, you may be buying someone else's mistakes or troubles.

Some television receivers are suitable for use only in urban and suburban areas because they do not have the sensitivity needed to pull in more distant stations. It is true, also, that some receivers which are sufficiently sensitive for use in the fringe areas may not work too well when used in areas close to the stations simply because they overload on strong signals.

As a general rule, therefore, a portable or the less expensive regular model is used to best advantage in areas up to 50 miles from a station. At greater distances you are likely to be best served with the most sensitive receiver in a manufacturer's line. It does not follow, however, that the most sensitive receiver is the most expensive. Rather, the selling price of a receiver is dependent far more on the type of cabinet you choose, i.e., table model or console.

In the listings, the picture tube size given is that of the diagonal (distance across the picture from corner to corner). Prices are manufacturers' recommended list prices; however, most of these sets are available at considerably lower prices at discount houses and appliance and department stores throughout the country. All cabinets were of metal unless otherwise noted in the listing.

Table-model receivers

The chassis used in these sets are also available in several other table and console models of the same makes. Any dealer should be able to inform you of the model numbers of those receivers he carries which employ a chassis that is the same as or similar to the one present in the set CR tested. Thus, if he does not have in stock the particular table model reported on, or you prefer a console model, ask your dealer to suggest a substitute.

A. RECOMMENDED

General Electric 21-inch Table Model, No. 21T1542 (General Electric Co., Syracuse) $249. Above average in the more important characteristics. Should provide a reasonably good picture in areas at a considerable distance from the stations—the so-called fringe areas. Uses the new wide-angle, short picture tube. Transformer power supply, a good feature (see "Safety," page 14).

Hoffman Topanga 21-inch Table Model, No. 1261 (Hoffman Electronics Corp., Los Angeles 54) $270. A good receiver for urban and suburban locations. Good sound, and a well-built and nicely finished wood cabinet. The *Dyna-touch Automatic* tuning was present but not functioning on the sample tested. Transformer power supply, a good feature.

Sylvania 21-inch Table Model 21T114M (Sylvania Electric Products, Inc., Batavia, N. Y.) $230. The general performance characteristics of this receiver were above average. It should provide a satisfactory picture in fringe areas. Chassis was line connected (selenium rectifiers were used), but wooden cabinet was well built and leakage current was satisfactorily low at exterior locations that might be touched by the fingers.

Westinghouse 21-inch Table Model 21T220 (Westinghouse Electric Corp., Metuchen, N. J.) $260. A well engineered set with nicely finished wood cabinet, desirable. Should provide a satisfactory picture in fringe areas. The set had an automatic tuning device which functioned satisfactorily.

Zenith 21-inch Table Model A2223Y (Zenith Radio Corp., Chicago) $210. Worthy of an *A* rating without qualification. Should provide a very satisfactory picture in fringe areas. This receiver, like the *GE* and the *Hoffman,* had a transformer power supply, a very desirable feature.

B. INTERMEDIATE

Admiral 21-inch Table Model T21E21 (Admiral Corp., Chicago 47) $200. The performance of this receiver, overall, was above average and the receiver would have received an *A-Recommended* rating if the leakage current had not been higher than CR's permissible limit (0.6 ma.) for an *A* rating. Set used a metal cabinet and a chassis connected indirectly to the power line.

RCA 21-inch Table Model 21T820 (RCA Victor TV Div., RCA, Camden, N. J.) $200. Performance was slightly below average in several respects, and leakage current was excessive. Transformer power supply, a good feature.

Silvertone (Sears-Roebuck's Cat. No. M—8114) $173, plus shipping charges. A 21-in. table-model receiver found satisfactory in most respects. Picture quality was average. Although the chassis was "hot" and a metal cabinet was employed, the designer of this receiver had shown considerable care to reduce the potential shock hazard to the user.

C. NOT RECOMMENDED

Andrea Hollywood 21-inch Table Model BT-VP21 (Andrea Radio Corp., Long Island City 1, N. Y.) $250. Wood cabinet. Transformer power supply, a good feature, but leakage current was excessive on one sample (0.8 ma.). On a second sample, leakage was 1.2 ma., above CR's permissible limit for a *B-Intermediate* rating. The *Andrea* would otherwise be worthy of a *B-Intermediate* rating.

Motorola 21-inch Table Model 21T39CH (Motorola, Inc., 4545 W. Augusta Ave., Chicago) $200. Performance was satisfactory in most respects. However, certain parts of the chassis were electrically "hot" (115 volts) and contact could be made with them at the rear of the cabinet. This condition would constitute a dangerous shock hazard, particularly for a small child or anyone attempting to adjust the receiver.

Portable receivers

A. RECOMMENDED

Silvertone Suburbanite 17-inch Portable (Sears-Roebuck's Cat. No. M—8102) $143, plus shipping. 30 lb. This receiver should provide above-average performance in urban and suburban areas. The designers are to be commended for the inbuilt freedom of the set from electrical shock hazard. While selenium rectifiers are employed, the chassis is not connected to the power line, and the cabinet is of fiber glass construction (desirable).

B. INTERMEDIATE

Admiral 14-inch Portable, Model P14D13 (Admiral Corp., Chicago) $150. 26 lb. The over-all performance of this receiver was well above average for a portable TV receiver. One side of the line was connected indirectly to chassis, and a metal cabinet was employed; the set would otherwise have been worthy of an *A-Recommended* rating.

General Electric 17-inch Portable, Model 17P1330 (General Electric Co.) $170. 30 lb. The picture and sound performance of this receiver were satisfactory. Leakage current was excessive, particularly for a set having a metal cabinet, and a chassis connected indirectly to the power line.

Philco Seventeener 17-inch Portable, Model F-3044A (Philco Corp., Philadelphia) $180. 34 lb. The performance of this portable was about average. One side of power line was connected (directly) to the chassis, and a metal cabinet was employed. Radiation of radio frequencies from the receiver was above the amount allowed by the Federal Communications Commission.

RCA 17-inch Portable, Model 17PD8093 (RCA Victor TV Div.) $190. 36 lb. Somewhat below average in several aspects affecting performance. Leakage current was excessive. This receiver had a metal cabinet and a chassis connected to the power line; both features are undesirable, especially in a portable set (see text).

Westinghouse 17-inch Portable, Model 17T244 (Westinghouse Electric Corp.) $170. 31 lb. On the basis of performance alone, this portable was worthy of an *A* rating, for picture and sound quality were above average. It had a metal cabinet, however, and the chassis was connected to the power line; these are both undesirable characteristics, particularly in a portable receiver.

Zenith 17-inch Portable, Model A1817G (Zenith Radio Corp.) $180. 46 lb. The over-all performance of this receiver was above average for a portable receiver. Leakage current was excessive, an undesirable condition, especially when present in a set with a metal cabinet.

▶ **REF:** Bulletin, Dec. 57.+++

* * *

For the convenience of subscribers interested in the purchase of a 1957-model receiver, which may be available at a sharp cut from original prices, brief model listings follow of the 1957 sets tested by CR.

Portable receivers

B. INTERMEDIATE

Admiral, Model T103-N; Emerson, Model 1232; RCA, Model 8PT7030; RCA, Model 14-S-7071.

C. NOT RECOMMENDED

Motorola, Model 14P5-2; Philco Roving Reporter, Model C-2004.

Table-model receivers

A. RECOMMENDED

Admiral, Model 223A1N; General Electric, Model

21T050; Philco, Model 4206-S; Zenith, Model Z3000R.

B. INTERMEDIATE

DuMont Trent, Model 21M5607; Emerson, Model 1176; Motorola, Model A21T33CH; RCA, Model 21T7152.

C. NOT RECOMMENDED

Sears, Model 7110.

Color receiver

B. INTERMEDIATE

RCA, Model 21CT7835.

▶ **REF:** Bulletin, Dec. '56+++, Jan. '57+++.

TELEVISION ANTENNAS

A good roof-top antenna is recommended for best TV reception. However, various types of indoor or window installations, commonly called "rabbit's ears" (see listings), or even one of the "built-in" antennas now supplied with practically all TV receivers may be satisfactory in metropolitan and some suburban areas.

Midget or miniature antennas marketed under such names as *Atomic Antenna, My-Tee Midget Antenna, Miracle Antenna, Silver Dollar Antenna, Tom Thumb Power Pak,* and others offered at $1.98 to $3, for which fantastic claims are made, are ineffective (no better than an 8-foot length of ordinary copper wire); see July 1954 Bulletin.

In VHF fringe areas, at distances of 50 to 75 miles, increasing the height of an outdoor antenna will normally improve reception. In these areas, a multiple-bay antenna will likely be required. For extreme fringe areas, up to 200 miles, a tall tower supporting an antenna of multiple-bay type array (see listings) is the best practical means to provide good reception. There may be some areas where the use of a booster is necessary, besides, to raise the signal level from the antenna to a minimum level that will produce an acceptable picture on the TV screen.

Good UHF reception is being attained at distances up to 40 miles with the use of so-called "bow-tie," "double bow-tie," and two-bay corner reflector antennas which are capable of receiving many channels.

Some advertisements indicate that an antenna of special design is required for the reception of color television programs. This is not true; any antenna which provides good reception of a black-and-white picture will be satisfactory. It is true, however, that your reception may gradually become poor because your antenna has become weatherworn and is therefore less efficient electrically. Thus, it may be worth while to have your antenna serviced and new, fresh lead-in wire installed periodically. In a few cases, the improvement in reception may be surprising.

Only a competent serviceman should be entrusted with the job of installing a TV antenna. He will know the height necessary, what kind of mast, guy wires, and lead-in to use, and the type of antenna (conical or Yagi, single-bay or two-bay, for example) which is needed to give satisfactory results in your area. In TV, there is no substitute for the backlog of specialized experience and skill at the command of an expert serviceman. About 60,000 homeowners are injured each year while installing TV antennas; thus, the risk of an accident of some sort is great.

The mast of any outdoor antenna should be properly grounded as a partial protection against lightning. Heavy copper wire (No. 6 is none too big) connected between the base of the mast and a good ground connection, such as a pipe driven 6 to 8 feet into moist earth, is usually satisfactory. A vent stack on the roof, or a drain spout, should not be used for the ground. A properly grounded lightning arrester on the lead-in (and on rotator control wires, if used) is a necessary additional safeguard.

The antenna mast and supporting guy wires must be so placed that they cannot, under any conceivable circumstances, fall over on or be blown against a power line, or come into contact with power wiring if either one should be blown down during a severe windstorm. A 10-foot clearance is considered an absolute minimum, and guy wires should *not* be secured to a pole carrying power. (Many deaths have occurred from disregard of this rule.) A loose or crumbling chimney makes a very poor—and dangerous—support.

Advertised list prices are given unless otherwise noted. Most of the antennas can be bought at lower or "net" prices (about 40 percent off list) from mail-order or discount houses. All outdoor antennas listed are multiple arrays. Ratings are cr55.

Indoor antennas

A. RECOMMENDED

JFD Star (JFD Mfg. Co., Inc., N.Y.C.) $9.95. Modified rabbit-ear type. Electrically similar to *Snyder 3-D.*

Snyder 3-D (Snyder Mfg. Co., Philadelphia) $7.95. Modified rabbit-ear type. Gain superior to that of simple rabbit-ear type for all VHF stations.

Snyder 5-D (Snyder Mfg. Co.) $12.95. Modified rabbit-ear type. Gain superior to simple rabbit-ear type for all VHF stations.

Unbranded (thought to be made by KG Electronics Corp., Chicago 14) Similar to *KG Delta Beam Kit,* Allied Radio Cat. No. 92C011, $3.63 net.

C. NOT RECOMMENDED

Magne-tenna, TENTenna, Walsco Star.

▶ **REF:** Bulletin, Oct. '55.+++

Outdoor antennas

A. RECOMMENDED

JFD "Jetenna" 161 (JFD Mfg. Co., Inc., 6101 16 Ave., Brooklyn, N. Y.) $24.75. Well-made, with good low- and high-channel performance. Judged to have good mechanical strength. Pre-assembled. Directivity, good.

B. INTERMEDIATE

Amphenol 2 bay inline, Model 114-314 (American Phenolic Corp., Chicago) $29. Electrical performance, average; exceptionally good mechanical construction. Directivity, poor on channels 2-6, good on channels 7-13. ¶Same as *114-302* and *114-322.*

Finco, Type 400 A (Finney Co., Cleveland) $42. Performed fairly well, but mechanical construction judged fair. Pre-assembled. For VHF and UHF reception. Not tested on UHF. Gain, fair.

C. NOT RECOMMENDED

All Channel, Type 150 (All Channel Antenna Corp., 70-07 Queens Blvd., Woodside, N.Y.) $43.50. Performance below that needed for fringe-area reception. ¶The *Riviera* model at $37 was not tested but is similar.

Gonset Radarray, No. 1527 (Gonset Co., Burbank, Calif.) $39.95. Gain, fair on channels up to and including 11. Fair mechanical construction.

▶ **REF:** Bulletin, May '55.+++

UHF CONVERTERS

The only way that a VHF (54 to 88 and 154 to 216 megacycles) receiver can be used to receive a UHF signal (470 to 890 megacycles) is with the use of a UHF converter. The converter may be a separate self-powered unit or may be in the form of individual "channel strips" which can be installed in the VHF tuner of some television receivers by a serviceman. The UHF strips are limited in usefulness to metropolitan and suburban areas, and a separate strip is needed for each UHF channel. A good UHF converter not only provides reception on all UHF channels but it will have the necessary "gain" for distant reception. All of the converters listed exhibited excessive radiation of a type that might interfere with a neighbor's reception. The prices given in the listings are list prices; converters are available at several mail-order radio and TV supply houses at a considerable discount. Ratings are cr54.

B. INTERMEDIATE

Granco, Model LCU (Granco Products, Long Island City, N.Y.) $40.

Mallory, Model 88 (P. R. Mallory & Co., Indianapolis) $35.

C. NOT RECOMMENDED

B.T. Lab., Model 99-BTC.

▶ **REF:** Bulletin, July '54.++

INTERFERENCE FILTERS

The chief cause of interference in a radio or a television set is from radiation from the power lines transmitted "through the air" to the antenna of the set. Such interference is usually indicated on the screen as bands of wavy lines or checks. In some cases it can be completely eliminated or at least greatly reduced by placing a filter of the proper type (see listing of *Drake TV-300-50HP*) in the antenna lead-in to the set. Interference entering a receiver through the power cord is best handled by a line filter placed as close as possible to the appliance or other source of the interference (rather than at the set).

Some advertisements would have one believe that *all* noises in radio and television receivers and also causes for picture jitters and other malfunctioning can be eliminated by using the promoter's "filter" device. CR knows of no all-purpose filter which can accomplish these results.

B. INTERMEDIATE

Bell-Tronic Line Cord Filter (Bell-Tronic Research, N.Y.C.) $1. Plug-type. Had some effect when the interfering appliance was plugged into the filter.

Belltronic Line Filter (Tube Wholesalers Co., Box 364, Rockville Centre, N.Y.) $1. Plug-type. Effective only when placed at appliance or noise source.

Drake High Pass Filter TV-300-50HP (R. L. Drake Co., Dayton, Ohio) $3.50. Functioned satisfactorily to attentuate electrical "noises" having frequencies below 50 mc.

▶ **REF:** Bulletin, Feb. '56.++

Home furnishings

Kitchen cabinets • counter tops • sinks

mattresses • springs • pillows • curtains

KITCHEN CABINETS

The consumer must decide for herself whether she prefers wood or steel kitchen cabinets. Both kinds are available in stock sizes at various prices, ranging from about $35 to $85 for base or floor cabinets 24 inches wide with one drawer and from $22 to $50 for wall cabinets 24 inches wide and approximately 30 inches high.

Though steel cabinets are noisier than wooden ones, they have certain advantages and are available in attractive colors. They are quite practical if well made. Half-round and quarter-round base cabinets are available as stock cabinets in steel, but only custom made in wood. Some steel cabinets are made with wood doors.

Kitchen cabinets are usually made in sizes with 3-inch increments; for example, 15, 18, 21, and 24 inches wide. (A few makers have cabinet widths based on 4-inch intervals.) Wall cabinets come in corresponding widths. Base cabinets are usually 20 to 24½ inches deep and 34½ inches high without the counter top. Wall cabinets, 12 to 13 inches deep, come in two heights, 18 inches for use over sinks and ranges and 30 inches for other places. Wall cabinets are usually installed 15 to 16 inches above the base cabinets to provide sufficient height for appliances that may logically be used and stored on the counter top beneath them. The usual cabinet height of 36 inches up to the counter top will be satisfactory for most women.

If built-in appliances are to be used, follow the space requirements given by the manufacturers of the appliances when buying the cabinets for them.

The homemaker who wants to make his own plan for locating the cabinets in the kitchen will find useful information in a series available from the Small Homes Council of the University of Illinois at Urbana:

C 5.31 Cabinet Space for the Kitchen
C 5.32 Kitchen Planning Standards
C 5.33 Separate Ovens
C 5.4 Laundry Areas

* * *

The following list of manufacturers of cabinets may help the consumer who wishes to do some comparison shopping among the brands made and distributed in his section of the country.

WOOD KITCHEN CABINETS

Aristorama Aristocrat Kitchens, Inc., New York 59
Beautycraft Miller Metal Products, Inc., Baltimore 30
Bel-Wood Bel-Wood Mfg. Co., Ackerman, Miss.
Bilt-Well Carr, Adams & Collier Co., Dubuque, Iowa
Boro Boro Wood Products Co., Inc., Bennettsville, S. C.
Bronzeglow Birch H. J. Scheirich Co., Louisville 9, Ky.
Coppes Napanee Coppes, Inc., Nappanee, Ind.
Curtis Curtis Companies, Inc., Clinton, Iowa
Del-Mar Del-Mar Cabinet Co., Inc., Atlanta, Ga.
Dixie-Maid Dixie Cabinet Co., Morristown, Tenn.
Futurama Precisionware, Inc., Brooklyn, N.Y.
Gregg Gregg & Son, Inc., Nashua, N.H.
I-XL I-XL Furniture Co., Chicago 10
Keystone Keystone Cabinet Co., Littlestown, Pa.
Kitchen Maid Kitchen Maid Corp., Andrews, Ind.
L-Co L-Co Cabinet Corp., Shamokin, Pa.
Living Kitchen Brammer Mfg. Co., Davenport, Ia.
Long-Bell Long-Bell Div., International Paper Co., Longview, Wash.
McLagan McLagan Millwork, Corvallis, Oreg.
Mengelwood; Crestwood Mengel Co., Louisville, Ky.
Morgan Morgan Co., Oshkosh, Wis.
Mutschler Mutschler Bros. Co., Nappanee, Ind.
Nevamar "Carefree" Nevamar "Carefree" Kitchens, Odenton, Md.
Picture Kitchens Henry M. Carr, Inc., Chicago 20
Qualitybilt Farley & Loetscher Mfg. Co., Dubuque, Iowa
Texboro Texboro Cabinet Corp., Mineral Wells, Texas
Westinghouse Westinghouse Electric Corp., Mansfield, Ohio
Whitehall Whitehall Cabinets, Inc., East Rockaway, N.Y.
Wood-hu Wood-hu Kitchens, Inc., Brockton, Mass.
Wood-Mode Wood-Metal Industries, Inc., Kreamer, Snyder Co., Pa.
Yorktowne Colonial Products Co., Dallastown, Pa.

METAL KITCHEN CABINETS

Beautycraft Miller Metal Products, Inc., Baltimore 30
Beauty Queen Toledo Desk & Fixture Co., Maumee, Ohio

Crane Crane Company, Chicago 5
Dimensional Raygold Industries, Inc., Copiague, N. Y.
Dwyer Dwyer Products Corp., Michigan City, Ind.
Eljer Eljer Div., Murray Corp. of America, Pittsburgh 22
General Chef General Air Conditioning Corp., Los Angeles 23
GE General Electric Co., Louisville 1, Ky.
Geneva Geneva Modern Kitchens, Geneva, Ill.
Jamestown Jamestown Metal Products, Inc., Jamestown, N.Y.
Kelvinator Kelvinator Div., American Motors Corp., Detroit 32
Oakland Oakland Foundry Co., Belleville, Ill.
RCA Whirlpool Whirlpool Corp., St. Joseph, Mich.
Republic Steel Republic Steel Corp., Berger Mfg. Div., Canton 5, Ohio
Richmond Richmond Metal Mfg. Corp., Philadelphia 15
St. Charles St. Charles Mfg. Co., St. Charles, Ill.
Shirley Shirley Corp., Indianapolis 2
Tracy-American Tracy Mfg. Co., Div. of Viclad Industries, Inc., Pittsburgh 33
Westinghouse Westinghouse Electric Corp., Mansfield, Ohio
Youngstown Youngstown Kitchens Div., American-Standard, Warren, Ohio

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Beautycraft, Dimensional, Geneva, Oakland, RCA Whirlpool, Richmond, St. Charles, Tracy-American, and Youngstown kitchen cabinets, although made of metal, are available with wood fronts. The Dimensional brand can also be surfaced with patterns from two lines of plastic laminate.

▶ **REF:** Bulletin, Mar. '58.+++

COUNTER TOPS

Nowadays it is not at all unusual to find several types of counter tops in one kitchen. A good grade laminated plastic top is likely to be the first choice among homemakers. These laminated hard plastics, which are rather rigid hard sheets (not the flexible vinyl plastics that are sold in rolls or as tiles), are sold under the brand names of *Consoweld, Corlex, Formica, Micarta, Parkwood, Panelyte,* and *Textolite.* They are resistant to hot water, fruit juice, grease, alcohol, and most household chemicals and are therefore most likely to withstand the kinds of use which would affect their durability, appearance, and the ease with which they may be kept clean. They are somewhat noisy and their surfaces will likely buckle and warp if a very hot vessel such as a skillet containing hot grease is set on them. It is best not to use solid color plastic tops on counters that receive very hard use.

The do-it-yourself homeowner will find either linoleum or one of the newer vinyl materials less costly, and easier to use for counter-top installations than the decorative laminates. They tend, however, to deteriorate around sinks and to change color or become stained by contact with detergents and household chemicals. The vinyl coverings, while inferior in heat resistance to decorative laminates, are more resistant to heat than linoleum. They also resist moisture, mildew, and rot, which sometimes affect linoleums. Linoleum has a greater resistance to some common household chemicals than do the vinyls.

Many women will want a small section of a counter in wood, regardless of the other surfaces used. How durable a wood top will be depends in part on the finish and the care used in sealing the wood.

Ceramic tile and stainless steel to cover counters are, with wood, the most expensive materials commonly used, and they have their disadvantages. Ceramic tile is hard and noisy, as is stainless steel. Use of stainless steel or other metal also involves a certain hazard. Electric appliances are sure to be used on counter tops and, if any of the appliances or plugs used with them have developed electrical leakage (shock hazard, as may easily occur with the presence of water), the danger of injury or death by shock will be very greatly increased if the appliance, connectors, etc., are used on a metal surface.

The edges of counter tops may be faced with strips of plastic laminate or with some kind of stainless steel, nickel-plated, or plastic edging strips. Plastic edging strips are to be preferred to metal ones, which have the disadvantage just mentioned in regard to stainless-steel or other metal counter tops.

The treatment that any counter-top surface receives in use and in cleaning will, of course, have a great deal to do with the service it will give. Use of harsh abrasives—such as scouring powder—should be avoided on all kinds of surfaces mentioned, particularly laminated plastics.

KITCHEN SINKS

The basic choice for the consumer in selecting a sink for the home kitchen lies between stainless steel and porcelain- or vitreous-enameled steel or cast iron. Both single- and double-bowl sinks are available. A double sink will require at least a 60-inch-long cabinet. It is suggested that for efficient use there should be 36 inches of counter space to the right of the sink bowl for stacking dishes prior to washing and 30 inches at the left for draining and drying dishes. Vitreous-enamel-coated steel sinks are usually the lowest in price, vitreous-enamel cast iron intermediate, and stainless-steel sinks the highest priced of the three.

Porcelain or vitreous enamel is a relatively thin coating of a melted-on glass-like material applied to a base of either sheet steel or cast iron. Steel, having the smoother and more even surface, sometimes takes a more uniform coating than cast iron. A porcelain-enameled steel sink can be entirely satisfactory, if it is sufficiently strong, installed without damage or strain, and used without undue abuse. Porcelain-enameled cast iron has a reputation for sturdiness and long life.

The thin glassy layers on both porcelain-enameled steel and porcelain-enameled cast-iron sinks are subject to permanent damage from such blows as the dropping of a heavy utensil, but porcelain-enameled cast iron is less likely to be damaged by impact or excessive weight, or by strains incurred during installation. The relatively hard outer coating of good porcelain enamel is not damaged by the acid and alkalies usually found in the home, but it is very often scratched and worn away in a few years by the use of an abrasive cleanser. (See "Scouring powders.")

Stainless-steel sinks are immune to chipping, cracking, and other surface damage due to accidental impacts and distortion, but are slightly susceptible to the action of strong acids and alkalies. They also easily show fingerprints and water spots, which meticulous housewives may find annoying.

Water and detergent should be adequate to keep a stainless-steel sink clean, though care should be taken to rinse the sink immediately after using any strong acid, alkali, or brine, to avoid staining and damage to the metal.

MATTRESSES

When you buy a mattress, you are trying to buy comfort for sleeping. Physicians say that this is best obtained if the bed is firm and flat. A very firm bed requires a strong bedspring, a mattress with strong innersprings, or a mattress of cotton felt or hair. A foam-rubber mattress is intermediate in firmness between one of the usual innerspring type and a felt or hair mattress.

Retailers customarily "promote" sales of mattresses on a price basis. Innerspring mattresses of one brand, for example, may at times be found over a wide range of prices, from a little under $30 to $70. In general, however, a mattress marked at $40 is one that was made to sell at $40, despite any claims made by the salesman that the mattress was really "made to sell for $60."

Unfortunately, though mattresses look much alike to consumers, there may be very important hidden differences in their quality.

Innerspring mattresses

All innerspring mattresses have coil springs between layers of padding. The springs are enclosed in individual cloth pockets or are fastened together by wires, clips, or other springs. The padding may be sisal, cotton, hair, rubber, or a combination of these. Special padding, extra wire or metal bands, and sometimes springs are used to make the sides firm and keep them from sagging.

Most innerspring mattresses have ventilation openings of some kind to permit access of air to the interior of the mattress. They also have handles to permit easy turning of the mattress—an important convenience, since improper handling of a mattress when it is turned can shorten its life.

One large bedding manufacturer suggests that extra-firm mattresses should be sold only to customers who are fairly heavy (200 pounds or more). An extra-firm mattress is likely to be too stiff and uncomfortable for sleepers of light or medium weight.

CR tested 17 innerspring mattresses to determine primarily their ability to stand up in service. Durability tests at CR were carried out on a machine which subjected each mattress to the action of a 285-pound roller which moved across the mattress from side to side, causing the springs to compress and expand repeatedly.

Ratings are cr54.

A. RECOMMENDED

Simmons Beautyrest Standard (Simmons Co., Brunswick Ave. and Allen, Elizabeth, N.J.) $69.50. Firm. **AA2**

Englander Red Line New Posture (The Englander Co., Inc., Brooklyn 6, N.Y.) $59.75. Firm. 2

Restonic Triple Cushion Orthotonic (Royal Bedding Co., Chicago 9) $69.50. Soft. 2

Sealy, Natural Rest (Sealy Mattress Co. of N.J., 196 W. Railroad Ave., Paterson, N.J.) $59.50. Soft. ¶*Enchanted Nite* mattress has same specifications, according to maker. 2

Serta, Perfect Sleeper (Made by Serta Associates, HonorBilt Products, Inc., Philadelphia) $59.50. Soft. 2

Serta "Sertapedic" (Made by Serta Associates, HonorBilt Products, Inc.) $69.50. Soft, though a little more firm than the *Perfect Sleeper.* 2

Simmons Beautyrest Extra Firm (Simmons Co.) $69.50. Firm, about the same as the *Standard.* 2

Eclipse Royal Posturguard (Eclipse Sleep Products, Inc., New York 16) $79.50. Firm. 3

Sealy Posturepedic (Sealy Mattress Co. of N.J.) $79.50. Firm. 3

Spring Air Back Supporter (Hyde Park Bedding & Mfg. Co., Reading, Pa.) $79.50. Firm ("less firm" side was little different in firmness from the "firm" side). 3

B. INTERMEDIATE

Slumber King (Simmons Co.) $39.95. Moderately soft. 1

Burton-Dixie Slumberon, No. 402 (Burton-Dixie Corp., Chicago 8) $59.50. Moderately soft. 2

Eclipse Superest Springwall (Eclipse Sleep Products, Inc.) $49.50. Firm, but somewhat softer than the *Posturguard.*	2
Spring Air Health Center Meadowlane (Hyde Park Bedding & Mfg. Co.) $59.50. Soft.	2

▶ **REF:** Bulletin, Oct. '54. Reprint available.

Rubber mattresses

Foam-rubber mattresses show considerable variations in price. Generally foam-rubber mattresses will be priced somewhat higher than innerspring mattresses.

The consumer should be wary of very low-priced rubber mattresses; any unusual difference in price may reflect a significant difference in the quality and life of the rubber. An attempt has been made by the Association of Bedding and Furniture Law Officials to set up specific designations of latex, latex foam-rubber pieces, shredded latex foam rubber, etc., to describe the various types of foam rubber used in bedding, and to require that makers show these designations on their labels. Some mattresses, it is reported, are made of rubber that has failed quality tests. Though such rubber slabs are marked seconds, they are covered with ticking, and the marking cannot be seen by the consumer. In one instance, a mattress containing 99 percent cotton and 1 percent rubber flakes was sold with a label carrying "foam rubber" in bold red type with the word "flakes" printed in small black script beneath it.

Rubber mattresses are only 4½ to 6 inches thick, several inches thinner than innerspring mattresses. "Matching" box springs are usually sold with them. A rubber mattress can, however, be used satisfactorily over any good bedspring, including open coil springs, especially coil springs having either a "platform" or convolute coil top. One or preferably two mattress pads can be used over the spring to provide the needed protection of the mattress.

Rubber mattresses, although they have a long life, will fail in time from "perishing" of the foam rubber. Good care, including keeping them away from sunlight, heat, and solvents, will prolong their life.

BEDSPRINGS

The bedspring is the foundation of a good bed. A bedspring that sags in the middle will make for discomfort, regardless of the condition or quality of the mattress. A bedboard, sometimes placed between the spring and the mattress, should not be used to compensate for the inadequacy of a spring that is in bad condition and needs replacement. If the spring is in good shape and a proper mattress is used, there is no need, as a rule, to use a bedboard, although one may have value for specific disabilities as diagnosed by a physician.

The most inexpensive bedsprings are coil springs, which sell at about half the price of box springs. Good coil springs will be made of heavy wire (99 coils of No. 10, 11, or 12 gauge wire are generally accepted as standard), will be braced well at the bottom, and reinforced with bands running up and down the length. Generally, the greater number of turns of wire in a coil, the more resilient and durable it will be. A coil spring having either a "platform" or "convolute-coil" top can be used satisfactorily with a foam-rubber or innerspring mattress. With a foam-rubber mattress, it might be best, however, to have a mattress pad, or even two, between the mattress and the spring to be sure the spring does not damage or wear the lower surface of the mattress.

Box springs have the springs stapled to wooden slats, tied together at the top, and fastened to an outer frame. The top and sides of the spring unit are padded; the springs cannot be felt unless they break or come loose. There is an "insulator," commonly cloth, between the coils and the padding.

PILLOWS

Pillows are usually 21 x 27 inches in size, and most pillow slips are made to fit this size. Rubber pillows or some of the new synthetic fiber-filled pillows may be somewhat smaller. Measure a pillow if you are not sure what size of pillowcase to buy.

Goose-down pillows are the most expensive. The finest quality white down pillows may cost as much as $15 or $16 each. On the other hand, a chicken-feather pillow of a standard size (21 x 27 inches) may cost as little as $2. Foam- or latex-rubber pillows cost about $7 to $10, but may be found on sale for around $5. *Dacron, Orlon,* or *Acrilan* synthetic-fiber pillows are similarly priced, at from $5 to $10. Down pillows of standard size weigh about 1½ pounds per pillow, goose feathers 2½ pounds, and chicken feathers 3½ pounds. A goose-feather pillow, it is said, will have a satisfactory life of 10 to 15 years, although one will often be used far beyond that period of time.

The softest and fluffiest filling for a feather pillow is goose down. Goose feathers are next in softness, then turkey and chicken feathers. Rubber pillows, like feather pillows, may be purchased in varying degrees of softness or firmness. Some people, however, do not like to sleep on a rubber pillow because of its "bounciness" under their head. Rubber pillows may be molded in one piece or in two or more pieces, or may be made of rubber which has been shredded and then cemented back together again. Rubber pillows will likely have a long life, though they will deteriorate in time.

Consumers' Research checked two makes of *Dacron* pillows for washability and found them not quite so easy to wash and dry as the advertising would have you believe. One became lumpy during washing and developed a disagreeable odor. It was concluded that these pillows should be dried thoroughly and quickly.

▶ **REF:** Pillows, selection, use, and care, by Evelyn Stout, Cornell Extension Bul. 969, Ithaca, N.Y.

WINDOW CURTAINS

A great many factors enter into the choice of curtains, which principally contribute to the attractiveness of the room, provide privacy, and frame the view. Sometimes curtains help to control light and the movement of air. The very practical considerations of ease of washing and ironing also enter into the selection. *Fiberglas* is the only fiber which requires no ironing, but this property has been freely claimed for other man-made fibers. As for *Dacron,* the question of ironing is open, and it depends on the finishes used and the care given the curtains in laundering.

To avoid disappointments caused by special characteristics of the fabric, follow the instructions on the tag or label. Some of the various finishes used can and do alter the properties of the fibers.

Acetate is resistant to heat and light, but is damaged by too-high ironing temperatures. *Celaperm, Chromspun,* or "color-sealed" acetate fabrics have the color added to the plastic mix before it is extruded as a fiber. These fabrics are guaranteed to be colorfast for two years or more.

Cotton curtains have a crispness that is lacking in some of the synthetic materials. Cotton is durable but deteriorates in sunlight. Cotton curtains tend to shrink and lose their shape in laundering, and the housewife is advised to make an allowance for shrinkage when she buys, rather than risk having to discard the curtains or spoil them by overstretching later.

Dacron has good resistance to sunlight when behind glass.

Fiberglas is resistant to damage by sunlight and heat, and is fireproof. It has poor resistance to abrasion and to flexing, however. The fabric may break wherever it rubs against a window sill and where rods are inserted. Although *Fiberglas* itself does not stain, the organic finishing materials used on the curtains may do so.

Nylon becomes yellowed in the sun and deteriorates in both heat and direct sunlight.

Rayon curtains are weak when wet and must be handled gently, particularly when they are put on stretchers.

Symbols used in this Annual

AA—regarded as worthy of highest recommendation.

A—recommended on basis of quality.

B—intermediate with respect to quality. Products are also sometimes rated **B,** on which the information is generally favorable, but not sufficiently detailed or documented to warrant an **A** recommendation.

C—not recommended on basis of quality.

Occasionally **A+**, **A—**, **B+**, etc., are used to indicate a somewhat closer distinction as to quality or performance within the usual **A, B,** or **C** ratings.

Listings usually are arranged in alphabetical order by brand name (not in order of merit) under each **A, B,** or **C** quality or performance rating.

1, 2, 3—relative prices, **1** being low, **3** high.

Where the **1, 2, 3** price ratings are given, brands in the **1,** or inexpensive, group are listed alphabetically, followed by brands in price group **2,** also in alphabetical order, etc.

cr—information from CR's own tests or investigations.

56, 57, 58—year in which information was reported in CONSUMER BULLETIN.

BULLETIN—CONSUMER BULLETIN (monthly).
Plus signs after a BULLETIN reference—one to three are used—give an idea of the amount of additional material to be found in the reference beyond that presented in this *Annual.*

Laundry equipment

Automatic washing machines • wringer washing machines

washer-dryer combinations • clothes dryers • irons

WASHING MACHINES

The washing machine has been listed as the most valued appliance in the home. Surveys also show that the washing machine, particularly the automatic, must be replaced oftener than other household appliances—once every six or seven years as compared to ten or longer for most other appliances.

Types of washing machines

There are basically four different types — wringer, spin-dry, automatic, and washer-dryer combinations (see page 28). Each type has certain advantages and disadvantages. They differ in initial cost and convenience in operation.

Wringer washers

The wringer machine is lowest in price initially and in cost of servicing, but the operator must handle the clothes between washing and rinsing. It permits the re-use of the wash and rinse waters—affording a possible saving of considerable water. The motor-powered wringer presents a great hazard to adults and children; it has caused many grave disabling and disfiguring injuries and even deaths.

Spin-dry washers

The spin-dry non-automatic machine, while safer to operate than a wringer washer, requires the handling of clothes between operations and costs almost as much as a low-priced automatic washer. Like the wringer machine, it permits the re-use of the wash and rinse waters.

Automatic washers

The automatic machine offers convenience, but it is expensive and the purchaser should realize that it may be costly to repair. Provision must also be made for connecting to hot- and cold-water lines, and for draining, and an electrical outlet may need to be installed; the total cost for *installation* of an automatic washer may be as much as $75 to $100 (above the price paid for the machine). There are basically two types of automatic washers: the rotating-cylinder and the agitator machines.

Performance

In general, while tests made by Consumers' Research indicate that the two types of automatic washers have about equally effective washing actions, better washing results can be obtained with the agitator-type machine because of the greater latitude it permits in the use of soap (in soft water) or synthetic detergents of the kinds that produce suds. Excessive amounts of suds interfere with the washing action of the rotating-cylinder-type machine and result in poorer washing.

The rotating-cylinder-type machine has been found superior for washing clothes which have been soiled heavily with sand or mud, as clothes worn by farmers. This type, too, is more satisfactory and convenient for the washing of such bulky items as blankets, quilts, pillows, and spreads.

Lint filters incorporated in some washing machines and strongly featured in advertising remove some lint from the wash water, but tests by CR showed that they do not remove all the lint, and pieces of dark clothing washed with white fabrics will still show lint at the end of the washing.

Safety tips

With any type of washing machine, it is essential that a substantial, permanently-attached ground wire be run from the machine to a metal cold-water pipe (even though the machine is one that is intended to be grounded through the cold-water hose).

Parents should not permit children near the machine at any time. There have been several deaths of children who climbed into washing machines (or dryers).

Any machine in which the tub continues to spin for more than a few seconds after the machine turns off when the wash is finished, is a potential hazard and may cause serious injury.

What to look for when buying

1. Availability of repair service in the same town, or close by.
2. That machine has a double water inlet valve which controls the temperature of the incoming water thermostatically.
3. If the machine has a fixed-time fill control, water pressure in the home should be *not less than 25 pounds* per square inch to assure that the tub will be filled with water to the correct level. Machines with pressure fill control can be used with water pressures as low as 10 pounds per square inch.
4. Total quantity of hot and cold water required for a full load. This affects the supply and also disposal where there is a septic tank or cesspool.
5. Quantity of hot water required for a complete cycle.
6. Amount of water left in the clothes. (This affects directly the cost of gas or electricity for drying in a dryer.)

Ratings

Unless otherwise stated, all machines in the following listings had either a shut-off device or some other means for preventing operation with a load badly out of balance. Prices shown in the listings do not include a "suds saver," which can be obtained on several makes at about $20 extra. Ratings are cr57, unless otherwise noted.

Automatic washers

A. RECOMMENDED

Easy Spiralator, Model ADF (Easy Washing Machine, Division of Murray Corp. of America, Syracuse 4) $330. Effectiveness in washing an 8-lb. load, good. Lacked shut-off for unbalanced load. Opening lid did not stop action; tub spun about 1½ min. after machine shut off.

General Electric Filter-Flo, Model WA-750M (General Electric Co., Louisville 1, Ky.) $350. Effectiveness in washing a 10-lb. load, good; a 12-lb. load could be washed, but with reduced effectiveness. Tub coasting time at end of cycle, about 1½ min. A noisy machine. cr55

Hotpoint, Model 10LK2 (Hotpoint Co., Chicago 44) $330. Effectiveness in washing an 8-lb. load, good. Tub coasting time, 50 sec. cr55

Kenmore Cycla-Fabric (Sears, Roebuck & Co.) Beginning at $245, plus shipping charges, when ordered from catalog. This model was similar to *RCA Whirlpool Imperial.* The *Kenmore* provided a choice of five different wash water temperatures, hot, medium, warm, cool, and cold; the *RCA Whirlpool Imperial* provided hot, medium, and warm.

Maytag, Model 140 (Maytag Co., Newton, Iowa) $380. Effectiveness of washing an 8-lb. load, very good. Opening the lid stopped action at any stage of cycle.

Philco Automatic Deluxe, Model W-266 (Philco Corp., Philadelphia) $370. Effectiveness in washing a 9-lb. load, good. Controls not as flexible as would be desirable for repeating or changing cycle. Design of machine was such that, with an unbalanced load, the tub operated without undue vibration (good design). Opening lid during cycle did not stop action; tub spun about 2 to 3 min. after machine shut off.

RCA Whirlpool Deluxe, Model W5704000 (Sales No. DA-40) (Whirlpool-Seeger Corp., St. Joseph, Mich.) $240. Effectiveness in washing an 8-lb. load, very good. Not a fully automatic washing machine since single-hose inlet required that user manipulate faucet valves to control temperature. Lacked shut-off for unbalanced load. Opening lid did not stop action.

RCA Whirlpool Imperial, Model W5704801 (Sales No. DA-90) (Whirlpool-Seeger Corp.) $370. Effectiveness in washing a 9-lb. load, very good. Lacked shut-off for unbalanced load. Opening lid during cycle stopped spinning action only.

* * *

Frigidaire, Model WDU-57 (Frigidaire Division, General Motors Corp., Dayton, Ohio) $340. Effectiveness in washing an 8-lb. load, good. Some tangling if clothes were not loaded according to instructions. Pulsating agitator.

Kelvinator, Model WAG6 (Kelvinator Division, American Motors Corp., Detroit) $290. Effectiveness in washing a 9-lb. load, good. Slight tangling. Agitator had vibratory action instead of the more common rotary oscillation action. Machine could not be shut off during certain parts of fill cycle. Opening lid did not stop action.

Norge, Model W5-450 (Norge Division, Borg-Warner Corp., Chicago 54) $330. Effectiveness in washing a 9-lb. load, fair to good, but for 8-lb. load, good. Equipped with plastic "Dispenser Wheel" which permits adding chemical softener, such as *Calgon,* when the machine is loaded, for the deep-rinse water. Cycle could be advanced or repeated only if machine was shut off first (desirable). This machine had a time-control fill but had provisions for adjusting maximum time period on regular cycle to meet water-pressure conditions of the home. Opening the lid did not stop filling or washing action but did stop spin action. ¶Service policy of manufacturer on previous models in response to a number of consumers' complaints of a serious nature regarding failures of the machines to function properly was not satisfactory.

B. INTERMEDIATE

Bendix, Model WGG-C (Philco Corp., Philadelphia 40) $350. Effectiveness in washing a 9-lb. load, only

AUTOMATIC

Brand	Rated capacity, pounds	Type of washing action	Type of water level control	Time for regular cycle, minutes	Time for short cycle, minutes	Water used for regular cycle, gallons		Electricity used for regular cycle, watt-hours
						hot	cold	
Bendix WGG-C	9	Rot. Cyl.	Press.	36	—	16	9	195
Easy ASF	8	Agi.	Time	30	—	13	14	195
Easy Spiralator ADF	8	Agi.	Press.	30	20	18	10	185
Frigidaire WDU-57	8	Pul. Agi.	Time	28	17	17	10	170
General Electric Filter-Flo WA-750M	10–12	Agi.	Press.	48	—	28	15	220
Hotpoint 10LK2	8	Agi.	Time	33	20	21	20	250
Kelvinator WAG6	9	Agi.	Time	34	15	19	11	180
Maytag 140	*	Agi.	Press.	37	—	16	7	150
Norge W5-450	9	Agi.	Time	33	19	21	10	170
Philco Deluxe W-266	9	Agi.	Press.	42	28	20	10	180
RCA Whirlpool Deluxe W5704000	8	Agi.	Press.	37	—	20	13	225
RCA Whirlpool Imperial W5704801	9	Agi.	Press.	41	22	23	10	280
Speed Queen Multi-Cycle A18	**	Agi.	Time	30	20	20	14	230
Westinghouse "Laundromat" L-100	9	Rot. Cyl.	Press.	44	—	16	8	230
Westinghouse "Space-Mate" LH-3	8	Rot. Cyl.	Press.	46	—	13	11	225

* Manufacturer recommends loading to top row of holes in tub.
** Manufacturer states capacity is "average normal washer load."
Agi.—Agitator; Rot. Cyl.—Rotating Cylinder; Pul. Agi.—Pulsating Agitator; Press.—Pressure.

fair (poorest of machines tested, even with 7-lb. load). Machine was found inconvenient to load, because of small opening and interference by the door. Noisy in operation and vibrated during spin cycle. Lacked shut-off for unbalanced load. Opening door did not stop action.

Easy, Model ASF (Easy Washing Machine, Division of Murray Corp. of America) $240. Effectiveness in washing an 8-lb. load, good. Machine lacked convenient and satisfactory means for grounding. Opening lid did not stop action; tub spun about 1½ min. after machine shut off. Operating instructions were not presented clearly. Machine lacked shut-off for unbalanced load.

Speed Queen Multi-Cycle, Model A18 (Speed Queen Corp., Division of McGraw Electric Co., Ripon, Wis.) $350. Effectiveness in washing an 8-lb. load, very good. Only machine of group tested which had provision for operating agitation and spin at regular or slow speeds on either regular or short cycle. Lacked shut-off for unbalanced load. Warm-water temperature not thermostatically controlled, as is desirable. Lid locked shut during all spin cycles but could be opened at other times without stopping action. Excessive leakage current of 1.2 ma. (a measure of shock hazard) would require that this machine be securely grounded for safe operation; otherwise would have received an *A* rating.

Westinghouse "Laundromat," Model L-100 (Westinghouse Electric Corp., Mansfield, Ohio) $350. Effectiveness in washing a 9-lb. load, fair. Slight tangling. Had built-in scale for weighing clothes loaded on open door (a convenient device). Opening of door during cycle stopped action.

Westinghouse "Space-Mate" Laundromat, Model LH-3 (Westinghouse Electric Corp.) $230. Effectiveness in washing an 8-lb. load, fair. Opening of door during cycle stopped action (desirable). Washer had leakage current of 0.8 ma. A dryer, *Model DH-3*, of identical outside dimensions, available at $170, can be located beside or mounted on top of the washer to provide washing and drying facilities, using minimum floor space. The washer operated on 115 volts whereas the dryer can be operated on either 115 volts or a 3-wire 230-volt circuit. Dried an 8-lb. load in about 35 min. on 230 volts, more than double this time on 115 volts. Dryer had provisions for venting vapor outdoors. Drying temperature range, 120° to 140°F, but temperature in dryer reached 210°F after clothes became dry.

▶ **REF:** Bulletin, Oct. '55+++, Jan. '57+++.

WASHERS

Water left in clothes, percent dry weight	Over-all dimensions, inches			Slow speed	Top or front loading	Water-temperature selection		Provisions for partial fill	Brand
	width	height	depth			wash	rinse		
80	31	40	28	No	Front	Hot, Med., Warm	Warm, Cool, Cold	Yes	**Bendix WGG-C**
82	27	38	26	No	Top	Hot, Warm	Warm	Yes	**Easy ASF**
78	30	40	25	Yes	Top	Hot, Warm	Warm	Yes	**Easy Spiralator ADF**
55	25	43	27	No	Top	Hot, Warm	Warm	Yes	**Frigidaire WDU-57**
65	27	40	28	No	Top	Hot, Warm	Warm	Yes	**General Electric Filter-Flo WA-750M**
72	26	42	29	No	Top	Hot, Warm	Warm, Cold	Yes	**Hotpoint 10LK2**
76	25	43	28	No	Top	Hot, Warm	Warm	Yes	**Kelvinator WAG6**
73	26	43	28	Yes	Top	Hot, Warm, Cold	Warm, Cold	Yes	**Maytag 140**
70	26	43	27	No	Top	Hot, Warm	Warm, Cold	Yes	**Norge W5-450**
80	26	43	27	No	Top	Hot, Med., Warm	Warm	Yes	**Philco Deluxe W-266**
79	25	37	26	No	Top	†	†	No	**RCA Whirlpool Deluxe W5704000**
75	29	42	27	Yes	Top	Hot, Med., Warm	Warm	Yes	**RCA Whirlpool Imperial W5704801**
81	26	42	28	Yes	Top	Hot, Warm‡	Warm‡, Cold	Yes	**Speed Queen Multi-Cycle A18**
80	31	40	29	No	Front	Hot, Med., Warm	Warm	"Low to High"	**Westinghouse "Laundromat" L-100**
80	25	36	26	No	Front	Hot, Warm	Warm	No	**Westinghouse "Space-Mate" LH-3**

† Machine has single hose inlet; see listing.
‡ Not thermostatically controlled; desired temperature must be set manually with faucets.
Med.—Medium.

Non-automatic washers

Agitator type with centrifugal dryer

B. INTERMEDIATE

Easy-Spindrier, Model 30SS. $210. Oscillating agitator. Maker's capacity rating, 8 to 9 lb. of dry clothes. Required 16 gal. of hot water to fill tub. Rinse required approximately 6 gal. of hot water and 12 gal. of cold water. Washing effectiveness, fairly good. Drying effectiveness, good. There have been some cases where rust has been deposited on clothes by this machine; purchasers would do well to check with users in their locality. cr50

Wringer washers

Because any power-wringer washer involves serious risks to housewives and children in the home, no machine of this type is rated higher than *B. Intermediate.* Ratings are cr54.

B. INTERMEDIATE

ABC, Model 350P. $150. Tub capacity, 17 gal. Force required to operate wringer safety release, 5 lb. at end of release handle (favorable), but over 20 lb. (too high) at center of handle.

Easy, Model 101-SWP. $170. Tub capacity, 16½ gal. Force required to operate wringer safety release, 17 lb. (not as low as would be desirable).

Maytag, Model N2LP. $140. Tub capacity, 17 gal. Force required to operate wringer safety release, less than 10 lb. (favorable). Washing effectiveness, very good.

Maytag, Model E2LP. $200. Tub capacity, 18 gal. Force required to operate wringer safety release, less than 10 lb. (favorable). Washing effectiveness, very good.

Speed Queen, Model 50P. $150. Tub capacity, 17 gal. Force required to operate wringer safety release, 16 lb. (not as low as would be desirable). Effectiveness of wringer, below average.

C. NOT RECOMMENDED

Apex, Model 3-1012P. $180. Tub capacity, 21 gal. Force required to operate wringer safety release, 15 lb. (not as low as would be desirable). This machine could easily be tipped over when no water was in the tub and the wringer was in the outboard position.

WASHER-DRYER

Brand	Rated capacity, pounds	Dimensions, inches			Time to wash, full cycle, minutes	Time to dry, full load, minutes	Water used, gallons		
							washer		dryer
		width	height	depth			hot	cold	cold
Bendix CGR-C	8	36	47	27	40	45	18	11	26
Bendix CGV-C	8	36	47	27	40	45	18	11	—
Easy CDF	8	28	39	26	39	65	20	5	33
General Electric 1WD560N1W	8	30	36	26	55	80	16	20	40
RCA Whirlpool W5710500	9	33	45	26	38	65	14	9	—
Westinghouse Deluxe WD-2	8	32	41	29	52	83	20	15	46

Kenmore, Model 110-543220. $98, plus shipping charges. Tub capacity, 17½ gal. Wringer did not comply with *UL* standards. Force required to operate wringer safety release, over 20 lb. (too high). Manufacturer states wringer has been redesigned to correct faulty functioning of safety release.

Norge, Model CW232P. $145. Tub capacity, 18 gal. Wringer did not comply with *UL* standards. Force required to operate wringer safety release, over 20 lb. (too high). Did not meet requirements for roll separation (rolls did not allow 2 in. clearance when safety release was operated). Washing effectiveness, very good.

Thor, Model 534ER. $125. Tub capacity, 15 gal. Force required to operate wringer safety release, about 5 lb. (favorable), but action was too violent. The drainboards dropped off, and the top roller jumped out of place when the safety release was tested.

Impeller type with squeeze dryer

C. NOT RECOMMENDED

Monitor Prestomat, Model MP. $200. 6 to 8 lb. Required 15 gal. hot water (130°) and 9 gal. cold water for first load; subsequent loads, 1 gal. hot water, 9 gal. cold for warm rinse. Washing effectiveness, good, but very uneven. Effectiveness in removing water, about the same as an average wringer. cr52

Small (portable) washers

A. RECOMMENDED

Hoover, Model 0319. $100. Tub capacity, 10 gal. Hand-operated wringer folds down into tub for storage. With 6-lb. load, washing was uneven. With 4- to 5-lb. load, washing ability was good, about equal to the average conventional machine on 8 lb. of clothes. Effectiveness of wringer, average. cr54

B. INTERMEDIATE

Monitor Aerator, Model 6-P. $75. Rated capacity, equivalent to about 3 to 4 lb.; 9 gal. of water. Washing ability, good, but not uniform. Hand-operated wringer folds into tub. *Important:* The *B* rating refers only to machines with an impeller consisting of 1 large segment and 2 fingers. Machines which have an impeller with 1 large segment and 3 fingers were rated *C. Not Recommended.* cr51

Taylor Junior, Model JW-5. $50. Tub capacity, 5 gal. Hand-operated wringer fastened to top of machine. With rated load (2 lb.), washing ability was fair. Effectiveness of wringer, average. cr54

▶ **REF:** Bulletin, May '50+, Nov. '51+, Apr. '52+, Sept. '54+++.

WASHER-DRYER COMBINATIONS

Before deciding to buy a washer-dryer combination, one should consider the pros and cons of the combination as compared to separate washer and dryer units.

On the plus side, a combination requires about the space of a single washer or dryer unit, and one does not need to handle the clothes between the washing and drying operations. An important disadvantage of the combination is that it prevents the homemaker from washing and drying at the same time, as both units are tied up when the machine is running.

The operating cost of most combinations is high. CR found the combinations tested, with the exception of the *Bendix*, did a poor job in extracting the water from the clothes during the spin period. Since the extra water must be removed in the drying cycle, this becomes expensive in use of gas or electricity, as well as time-consuming.

The prospective purchaser should also realize that, when some part of the combination fails to operate, both washer and dryer may be out of

COMBINATIONS

Water left in clothes, percent dry weight	Electricity used for complete cycle, watt-hours		Temperature in dryer, "Low," degrees F		Temperature in dryer, "High," degrees F		Water temperature selection		Brand
	dryer	washer	drying range	peak	range	peak	wash	rinse	
83	1080	3760	—	—	150–180	245	Hot, Med., Warm	Warm, Cool, Cold	**Bendix CGR-C**
83	320	275*	—	—	130–160	230	Hot, Med., Warm	Warm, Cool, Cold	**Bendix CGV-C**
102	410	4490	160–180	215	220–235	300	Hot, Warm	Warm	**Easy CDF**
110	345	4590	—	190	—	260	Hot, Warm	Warm	**General Electric 1WD560N1W**
120	1000	6200	95–115	150	95–115	230	Hot, Med., Warm	Warm	**RCA Whirlpool W5710500**
117	290	5940	—	—	190–225	305	Hot, Warm	Warm	**Westinghouse Deluxe WD-2**

* This unit used approximately 13,400 Btu of gas to supply heat for drying a full load.

service and the entire expensive appliance may need to be replaced if the trouble is serious. Another disadvantage of some combinations is that they require large amounts of cold water for condensing and disposing of the steam during the drying operation. The amount needed is substantial, as much as 46 gallons per load of clothes dried. Such use of water may burden a limited water supply or be expensive, as well as overload the disposal system if the waste water drains to a cesspool or septic tank.

In general, drums in combination machines are larger than those in washers and smaller than those in dryers designed for the same loads. Hence, a combination machine is likely to do a better job of washing than a rotating-cylinder type automatic but is likely to cause more wrinkling of clothes during drying.

Above all, it is important that, when a combination is bought, good local repair service should be available.

Ratings are cr57.

B. INTERMEDIATE

Bendix Duomatic, Model CGR-C (Philco Corp., Philadelphia 40) $550. All-electric model. Effectiveness in washing an 8-lb. load, fair. Machine had pre-wash or pre-soak cycle and provision for small, medium, or full load fill. Did best job of combinations tested in extracting water by spinning from clothes. Machine vibrated during fast spin and was relatively noisy.

Bendix Duomatic, Model CGV-C (Philco Corp.) $550. Washer unit operated on electricity; dryer heater operated on gas. Performance of this combination similar to *Model CGR-C*.

Easy, Model CDF (Easy Washing Machine, Division of Murray Corp. of America, Syracuse 4) $480. Effectiveness in washing an 8-lb. load, fair. Machine was designed to be fastened to floor. Machine could be pre-set to stop at any part of the wash, rinse, or dry cycle. If the control dial was reset during operation beyond the stopping device, the machine did not stop at the end of the drying period but proceeded into a new washing cycle. This machine used relatively large quantities of water and electricity. CR suggests that the new owner of this machine fill, drain, and refill the washer several times in the presence of the installer or demonstrator because the water inlet line requires very careful adjustment to avoid the possibility of water backing up and flooding.

* * *

Kenmore Turbo-Matic (Sears, Roebuck & Co.) Beginning at $400, plus shipping charges, when ordered from catalog. This model was similar to *RCA Whirlpool,* but the controls on the *Kenmore* were located on a panel at the rear of the top instead of at the front of the machine. The *Kenmore* had an 8400-watt air heater which gave faster drying than the 5600-watt heater of the *RCA Whirlpool.* The loading door of the *Kenmore* was hinged at the bottom so that, when open, it provided a tray that facilitated loading and unloading and prevented clothes from dropping to the floor.

RCA Whirlpool, Model W5710500 (Sales No. DC-50) (Whirlpool-Seeger Corp., St. Joseph, Mich.) $530. Effectiveness in washing a 9-lb. load, fair. Electric water heater made possible a hot-water wash even if warm or cold water was supplied; the fact that this heater operated during the entire wash period when water temperature was set at "Hot" caused a relatively high consumption of electricity for the wash cycle. The dryer operation, designed for outside venting, used no water but had relatively high consumption of electricity. To wash and dry a 9-lb. load of clothes cost 14c or more for electricity, even at only 2c per kwhr. of electricity; this is about double the cost of using a separate washer and electric dryer. Excessive leakage current of 3.0 ma.; satisfactory for safe operation only if securely grounded.

Westinghouse Wash 'N Dry Laundromat Deluxe,

Model WD-2 (Westinghouse Electric Corp., Mansfield, Ohio) $530. Effectiveness in washing an 8-lb. load, fair. Machine used relatively large quantities of water and electricity. Leakage current was excessive (2.5 ma.); appliance should be securely grounded. The loading door, hinged at the bottom, prevented clothes from dropping to the floor.

C. NOT RECOMMENDED

General Electric, Model 1WD560N1W (General Electric Co., Louisville, Ky.) About $500, plus top. An under-counter combination. Effectiveness in washing an 8-lb. load, fair. Machine designed to be fastened to floor. Poor distribution of clothes caused unbalance switch to be actuated repeatedly, preventing cylinder from revolving at faster speed, leaving clothes quite wet. Machine used relatively large quantities of water and electricity. Markings on control dials were somewhat ambiguous, and instruction booklet was not clearly written. Had excessive leakage current. ¶*Model WD660P2,* a free-standing (self-contained) unit, gave similar performance.

CLOTHES DRYERS

A clothes dryer can greatly simplify home laundering—particularly since clothes can be dried any time of the day and without regard to weather conditions. A dryer, however, has certain limitations which the user should realize and understand in order to get best results.

The right degree of drying is important, to avoid excessive wrinkling. Wrinkling, particularly of wrinkle-resistant garments, can be minimized by drying only a few articles at a time. With normal loads, the articles should be removed from the dryer when they feel slightly damp to the hand. Clothes which are to be ironed should be removed while they are still damp. Articles, such as corduroy, woolens, velveteens, sweaters, etc., should be dried along with several wet colorfast sponges or wet towels. (Other items of a sort that would not add lint to dark garments may be used instead of sponges or towels.) It is advisable to straighten out collars and sleeves of garments before drying them to minimize the work of ironing. For uniform drying, it is wise to place like articles or fabrics together.

Items which should not be dried in a dryer are: garments marked "dry away from heat," rubber-coated articles, and articles made of foam rubber. Especially avoid dryer-drying of cleaning cloths or mops saturated with floor or furniture or auto wax or cleaning solvents, and clothes which have been cleaned or "spotted" with any kind of dry-cleaning fluid or solvent. (There is danger of fire and explosion or poisoning of persons in the house by the fumes given off.)

Most electric dryers can be operated on either 115 volts or 230 volts but 115-volt operation makes drying time two to three times as long as 230-volt operation. Installation costs, however, for a dryer operating on 115 volts will usually be less since no special wiring is likely to be required for the 115-volt installation. A gas dryer will be priced as much as $50 above a comparable electric dryer but will usually cost less to operate, depending on local rates for gas and electricity. For example, the cost of drying one load in a gas dryer will usually be about 1½ cents as compared to 5½ cents to 6 cents for an electric dryer. A gas dryer *must* be vented to the outside of the house (not to a chimney) to carry away the hot, moist air and particularly, the gaseous products of combustion.

To avoid damage to paint and wood framing in a home and possible rusting of cabinets, appliances, tools, machines, etc., it is best to vent the hot, moist air from any dryer to the outside when the dryer is one that is designed to be vented.

New tests of electric and gas dryers were in progress at the time this issue went to press.

HAND IRONS

When selecting a hand iron, give consideration to its comfort in use. In line with this the iron should have: (1) beveled edges or special indentations on the sides for ironing under and around buttons; (2) a soleplate shaped to suit the user's needs, with a narrow point at one or both ends for ironing ruffles; (3) a suitable back or side rest; (4) a comfortable handle; and (5) reasonably light weight.

In addition, a hand iron should deliver a sufficient amount of heat at a fast enough rate, and should have a dependable automatic temperature control. No iron that lacks an automatic temperature control should ever be used (serious fire hazard).

The following chart of suggested ironing temperatures for common fabrics may be used as a guide for the setting of an electric-iron thermostat by a repairman.

Marking on control	Usual temperature range
Rayon*	225° to 325°F Average 275°
Silk	275° to 400°F Average 350°
Cotton	350° to 475°F Average 425°
Linen	350° to 525°F Average 450°

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* Applies to acetate and some synthetic fibers, such as nylon and *Dacron*, that require specially low ironing temperatures; rayon actually can be ironed safely at a setting close to that for cotton.

The thermostats in some irons may have been set incorrectly by the manufacturer, hence it is well to watch the behavior of a new iron to see how it performs in ironing various fabrics. If the iron appears to get too hot or too cool at some of its settings, its performance should be checked by an appliance serviceman.

Dry irons

The cords on all the irons tested were permanently attached and were at least 5½ feet long, the minimum length needed when the outlet is on the wall and faced by the user. All the irons were sufficiently stable on their heel rests so that they did not tip over readily.

The thermostat control of each iron tested, except the *General Electric*, became too hot after 30 minutes of operation at high setting; other parts likely to be handled also became too hot on some irons. (150°F is considered to be the maximum safe temperature for non-metallic parts likely to be touched by the hand.) The irons passed tests for electrical safety, except as noted. Irons tested were for a.c. only. Ratings are cr53.

A. RECOMMENDED

American Beauty 33AB (American Electrical Heater Co., Detroit 2) $13.95. Weight, 3¼ lb. Good performance. Fairly convenient to use.

General Electric 139F23 (General Electric Co., Bridgeport, Conn.) $9.95. Weight, 2½ lb. About average performance. Convenient to use.

General Mills, GM 1BB "Sponsored by Betty Crocker" (Home Appliance Div., General Mills, Inc., Minneapolis 13) $14.95. Weight, 3¼ lb. Likely to be less satisfactory than other *A* irons for "heavy" ironing. Convenient to use, but side rest judged inconvenient and a possible burn hazard.

Mary Proctor Never-Lift 991 (Proctor Electric Co., Third and Hunting Park Ave., Philadelphia 40) $13.95. Weight, 3¼ lb. Good performance. Convenient to use.

Westinghouse ID-513 (Westinghouse Electric Corp., Mansfield, Ohio) $12.95. Weight, 3¼ lb. Good performance. Convenient to use.

B. INTERMEDIATE

Century Glide-O-Matic IC-01-CSA, App. No. 8304 (Century Product Works, Inc., 507 W. 56, New York 19) $9.95. Weight, 3 lb. About average performance. Fairly convenient to use. Tip of soleplate turns up, judged inconvenient. Users had to exercise care in setting thermostat control so as not to touch exposed hot metal.

Dominion 1011 (Dominion Electric Corp., Mansfield, Ohio) $9.95. Weight, 3¼ lb. Cord readily moved from one side to other for right- or left-hand ironing. About average performance. Convenient to use.

Kenmore 6255 (Sears, Roebuck & Co.) $9.95, plus postage. Weight, 3½ lb. Pilot light to indicate when current was on. One of three samples failed early. Good performance. One of two samples failed high-voltage breakdown test under normal conditions. Convenient to use.

Handyhot 1175 (Chicago Electric Div., The Silex Co., 6333 W. 65, Chicago 38) $11.25. Weight, 3 lb. Pilot light to indicate when current was on. Only fair performance. Convenient to use.

Hoover 010 (The Hoover Co., North Canton, Ohio) $13.95. Weight, 3¼ lb. About average performance. On one sample, thermostat was incorrect (temperatures too high for fabrics shown on control markings). Convenient to use.

Sunbeam Ironmaster A-9 (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $14.95. Weight, 2¾ lb. About average performance. Failed high-voltage breakdown test under high-humidity conditions. Convenient to use.

Universal Stroke-Sav-r EA-B1205, EA-1205 (Landers, Frary & Clark, New Britain, Conn.) $13.95. Weight, 3¼ lb. Had largest soleplate area of irons tested. Good performance. On one sample temperatures were erratic and did not repeat during test runs. Convenient to use for most ironing, but extra-sized soleplate was found an inconvenience for ironing ruffles.

▶ **REF:** BULLETIN, Aug. '53.++

Steam irons

Steam irons operate in one of two different ways and are classified as the flash-boiler type and the kettle type. The flash-boiler type (now the most common) turns the water into steam drop by drop and produces steam shortly after it is turned on; it may have either a built-in water tank or a separate tank. This type of iron is quickly changed to a dry iron by operating a valve which controls the flow of water. The kettle-type steam iron has a built-in tank which holds the water, and the whole volume of water must boil before steaming begins. The steaming is therefore slower than with the flash-boiler type. To change from steam to dry ironing with the kettle-type iron, the user must pour the water out of the tank or let the water boil until the iron is dry.

Tap water can be used in all steam irons but, unless the water is mineral-free, deposits will soon reduce the efficiency and in time plug the steam outlets. If the tap water supply is hard, it will be best to use distilled, demineralized, or cistern water. Water that is softened by household water-softening equipment (zeolite softener) should not be used; it will leave deposits of sodium salts.

For many women, getting distilled or demineralized water is too much trouble, and they may prefer to have their irons serviced every 2 or 3 years rather than bother to use water of high purity. However, such servicing will take time and will likely not be cheap.

Chemical cleaners for steam irons have proved unsatisfactory in use and are not recommended. Such cleaners produce a surface film on the metal which interferes, to some extent, with the conversion of water into steam in the type of steam iron which is now most common, namely the flash-boiler type. The best way to remove the accumulation of deposits is to have the iron serviced by the manufacturer.

Except as noted, irons were for use on alternating current only. Ratings are cr55, except as noted.

Steaming time of irons tested

*Iron**	*Average duration steaming time, minutes*
Casco N3	48
GE F19, Travel	9½
GE F50	23½
Hoover 013	31
Sunbeam S-3	100
Sunbeam S-4	32
Westinghouse IS-521	27

* Samples of the *Presto* and *Universal* irons failed tests for electrical safety, and these were therefore not given the other tests.

A. RECOMMENDED

General Electric F19 (General Electric Co., Bridgeport 10, Conn.) $14.95. Ac-dc. A flash-boiler travel iron. Had detachable rubber bulb as water container. Weight: 1 lb. 13 oz. without bulb, 2 lb. 2 oz. full. Found convenient as a travel iron and also for ironing small areas. Tests indicated that this iron would not be suitable for heavy-duty ironing.

General Electric F50 (General Electric Co.) $14.95. A flash-boiler iron with water reservoir within the iron. Weight: 3 lb. 8 oz. empty, 3 lb. 15 oz. full. Convenient to use and judged one of two best in practical use tests. Handle designed for right- and left-hand ironing. ¶New *F60* is similar but has cord connection at center to improve suitability for both right- and left-hand use.

B. INTERMEDIATE

One or both samples tested of the *Casco N3, Hoover 013, Sunbeam S-4,* and *Westinghouse IS-521* irons gave leakage current measurements which indicated the presence of a slight shock hazard.

Casco N3 (Casco Products Corp., Bridgeport 2, Conn.) $18.95. A kettle iron.

Hoover 013 (The Hoover Co., North Canton, Ohio) $19.95. A flash-boiler iron.

Mary Proctor Never-Lift, Model 990 (Proctor Electric Co., Philadelphia 40) $13.95; water reservoir, $5. A flash-boiler iron. cr52

Sunbeam S-3 (Gravity Feed) (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $21.50. A flash-boiler iron.

Sunbeam S-4 (Sunbeam Corp.) $17.95. A flash-boiler iron.

Westinghouse IS-521 (Westinghouse Electric Corp., Mansfield, Ohio) $17.95. A flash-boiler iron.

C. NOT RECOMMENDED

The following failed electrical tests:

Presto S-11 (Presto Industries, Inc., Eau Clair, Wis.) $17.95.

Universal Stewardess 1675 (Landers, Frary & Clark, New Britain, Conn.) $14.95. A travel iron.

Universal 1801 (Landers, Frary & Clark) $17.95.

IRON-CORD HOLDERS

An iron-cord holder, if well designed, is a practical accessory. It adds convenience to ironing by preventing the cord from dragging across the clothes being ironed. Thus it prevents the soiling and wrinkling of the clothes, and will lengthen the life of the cord by keeping it away from the hot iron.

A. RECOMMENDED

American Beauty Iron Cord Guide, Cat. No. 7170 (American Electrical Heater Co., Detroit 2) $1.50. Does not fit some metal-top ironing boards. cr52

Maid of Honor (Sears-Roebuck's Cat. No. 11—6069) $1.69, plus postage. cr56

Proctor Cordminder, Model 50A (Proctor Electric Co., Philadelphia 40) $4. cr53

Rest-A-Cord (Wes-Ko Distributors, Inc., 2619 Santa Fe Ave., Los Angeles 11) $1.75. cr51

Radio

Table model radios • portable radios

clock radios • receivers made abroad • automobile radios

Remarkable as it may seem in this age of television, more than 10,000,000 radios were made and sold last year. While there were few or no changes made, except in appearance, in the old standbys of the industry—table models and clock radios — transistor-operated models accounted for more than one half of the automobile and portable radios sold in 1957. Thus it seems that the trend toward transistors and away from vacuum tubes has been well established.

The transistor radio can offer little more than low-cost operation combined with reduced weight and cabinet size. In some respects a transistor radio, as now made, is at a disadvantage compared with one using vacuum tubes.

All AM radio listeners still suffer because of poor nighttime reception. Though often blamed on the receiver itself, it will very likely be due to static, fading, and certain distortions of voice and tone incident to the atmospheric condition at the time, or distance from the station. Interference from stations close to each other on the dial or stations broadcasting on the same frequencies is also a factor at certain times.

There is always a danger of shock (or even electrocution) from any radio under certain conditions of use. Never use a radio that is connected to the power lines, in a damp or wet place. The hazard is especially great in a bathroom or kitchen. Always remove the power plug from the socket and then wait a few minutes at least before attempting to work on the set.

FREQUENCY MODULATION (FM)

FM broadcasting—and reception—has been the problem child of the radio industry and the Federal Communications Commission for many years. During the past two years, however, and particularly during the last year, interest in FM has shown a marked increase. Indeed, there are now cities in the U.S., New York among them, where the maximum number of FM stations allowed have been allocated channels.

Very likely, the present interest in FM listening may be attributed to the greatly increased interest in high fidelity for, when good quality receiving equipment is used, FM permits highly realistic reproduction with wide-frequency and dynamic ranges (see section on "High fidelity"). This advantage is not afforded by a table model, because sound quality of all small sets is severely limited by the size of the cabinet. There are now many so-called "good-music" stations throughout the country which present high-quality sound broadcasting, and these are all FM stations.

RECEIVERS FOR AM RECEPTION

Table models

Practically all makes of table-model and clock radios, nowadays, employ 3, 4, or 5 tubes, plus a rectifier. The 3-tube-plus sets provide reception that may be satisfactory for daytime listening to strong local stations. They are built to sell at a low price. The 4-tube-plus models give satisfactory reception in most areas. The 5-tube-plus set is generally to be preferred.

On many new models, regardless of makers' claims, the tone quality is poor because of the small cabinets and speakers used. Servicing, too, is now more difficult and time-consuming because of the use of printed wiring and the greater dexterity and care required when the repairman replaces components.

Prices generally will vary depending upon the number of tubes used, the quality of the cabinet, and the size and number of speakers employed.

A. RECOMMENDED

Emerson, Model 853, Series B (Emerson Radio &

Phonograph Corp., New York City) $27. Two 4-in. speakers. Plastic cabinet. Sensitivity, average; selectivity, good. Volume of sound output was somewhat below average, but tonal quality was good.

Sylvania, Model 519 (Sylvania Electric Products, Inc., Radio Television Div., New York 19) $24.95. 4-in. speaker. Plastic cabinet. Sensitivity, average; selectivity, fair. Good volume of sound output, with satisfactory tonal quality.

B. INTERMEDIATE

Admiral, Model 244 (Admiral Corp., Chicago 54) $21.95. 4-in. speaker. Plastic cabinet. Sensitivity and selectivity, fair. Volume of output was below average when the volume was turned down to the point at which distortion was reasonably low. Tonal quality, fairly good.

General Electric, Model 860 (General Electric Co., Radio Receiver Dept., Bridgeport 2, Conn.) $29.95. 5-in. speaker. Plastic cabinet. Sensitivity, average; selectivity, fair. Distortion was present in the sound output even at low levels of volume.

RCA 8X6M (Radio Corp. of America, RCA Victor Div., Camden, N.J.) $24.95. 4-in. speaker. Plastic cabinet. Sensitivity, good; selectivity, fair. Volume of sound output, fair. Total quality, average.

PORTABLE RADIOS

More all-transistor portables were sold last year than portable models using tubes. Transistor portables are generally higher priced than regular all-tube portables, but are relatively inexpensive to use because the batteries last a long time. Tone quality may be expected to be poor and volume of sound output low unless you purchase one of the more expensive models, $75 and up. The all-tube portables listed are the three-way kind that may be used on house current or on batteries.

Ratings are cr58.

Transistor portables

A. RECOMMENDED

DuMont, Model 1210 (Allen B. DuMont Labs., Paterson, N.J.) $90. Weight, 2.4 lb. Six transistors. Leather case, 5 in. high, 7 in. wide, and 3 in. deep. 3½-in. speaker. Sensitivity and selectivity were good. Volume of sound output was higher than with most portable sets, and total quality was good. Estimated cost of operation per hour, 0.4c.

RCA, Model 8-BT-10K (Radio Corp. of America, RCA Victor Div., Camden, N.J.) $75. Weight, 3.6 lb. Leather case was 7 in. high, 10 in. long, and 4 in. deep. 6-in. oval speaker. Sensitivity was good; selectivity, fairly good. Volume of output was higher than average, and tonal quality was good. Estimated cost of operation per hour, 0.3c.

B—

Emerson 888 (Emerson Radio & Phonograph Corp., New York City) $44. Weight, 1.3 lb. Eight transistors were employed. Plastic case, 4 in. high, 6½ in. long, 2 in. deep. 3½-in speaker. Sensitivity and selectivity were fair. Volume and tonal quality of sound output were only fair. Estimated cost of operation per hour, 0.6c. This portable is worthy only of a *B—* rating in relation to the *DuMont* or *RCA* transistor portables. In view of its relatively low price, however, it may provide a satisfactory compromise purchase for those who are unwilling to spend $75 to $90 for a better transistor receiver.

General Electric P-710A (General Electric Co., Radio Receiver Dept., Bridgeport, Conn.) $35. Weight, 1 lb. Plastic case, 4 in. high, 6½ in. wide, 1¾ in. deep. Four transistors were used. 2½-in. speaker. Sensitivity and selectivity were fair. Volume of output was low; tonal quality, fair. Cost of operation per hour, 2c.

Vacuum-tube portables

A. RECOMMENDED

RCA, Model 7-BX-9H (Radio Corp. of America, RCA Victor Radio & "Victrola" Div., Camden, N.J.) $70, plus $6.75 for batteries. Provided for reception of the regular broadcast band and the short-wave band (2 to 5 megacycles). Plastic cabinet, 8¾ in. high, 11⅜ in. wide, 5¼ in. deep. 4-in. speaker. Sensitivity, good. Volume of output, average. Tonal quality, average.

Zenith, Model A-400 (Zenith Radio Corp., Chicago 39) $30, plus $5.70 for batteries. Plastic cabinet, 8¾ in. high, 11⅛ in. wide, 2¾ in. deep. 4-in. diameter speaker. Sensitivity, very good. Volume of output, about average for a portable set. Tonal quality, good.

B. INTERMEDIATE

Emerson 879-B (Emerson Radio & Television Corp., New York City) $35, plus $4.85 for batteries. Plastic cabinet, 10 in. high, 11 in. wide, 3 in. deep. 3-in. speaker. Sensitivity, fair. Volume of output, average. Tonal quality, good.

Motorola, Model 5P31A (Motorola, Inc., Chicago) $32, plus $5.20 for batteries. Fabric-covered metal cabinet, 7½ in. high, 10¼ in. wide, 4 in. deep. For reasons of safety, CR prefers the use of a plastic or other non-conducting material to metal, for cabinets. 4-in. speaker. Sensitivity, good. Volume of sound output, below average. Tonal quality, fair.

Westinghouse, Model 557P4 (Westinghouse Electric Corp., Metuchen, N.J.) $35, plus $3.30 for batteries. Plastic cabinet, 6¼ in. high, 8¾ in. wide, 3⅛ in. deep. 4-in. speaker. Sensitivity, good. Volume of output, average. Tonal quality judged fair.

C. NOT RECOMMENDED

Sylvania, Model 3201 (Sylvania Electric Products, Inc., Radio Television Div., New York 19) $34.95, plus $4.50 for batteries. Shock hazard was above CR's limit; this set would otherwise have been worthy of an *A-Recommended* rating.

Solar-powered portable

A. RECOMMENDED

Acopian Solar Radio (Acopian Technical Co., Phillipsburg, N.J.) $15 list. Purchased from Radio Shack, a big mail-order dealer in Boston, for $11. In the novelty class of radios, but has its uses. Suitable only for listening (by earphone) to stations not over 10 to 15 miles distant.

Clock radios

The electric clock in a clock radio either sounds an alarm or turns the radio on at the selected time in the morning, or both. Some also turn the radio off automatically at night after a stretch of bedtime listening, and some have a 115-volt outlet to permit plugging in of other electrical appliances, which can be turned on or off by a switch actuated by the clock. The radio section is usually a conventional 5-tube ac-dc radio.

Ratings are cr56.

A. RECOMMENDED

Zenith Y-519R (Zenith Radio Corp., 6001 Dickens Ave., Chicago 39) $40. ¶Newer model, *A515Y*, at $40 appears to be similar. 2

B. INTERMEDIATE

Motorola 56CC2 (Motorola Inc.) $40. ¶Newer model, *57CC2*, at $40 appears to be similar. 2

General Electric 661 Convertible Clock-Portable (General Electric Co.) $50. Combination clock radio and battery-operated portable radio. ¶Newer model, *680*, at $47 appears to be similar. 3

▶ **REF:** Bulletin, June '56.+++

EUROPEAN-MADE AM-FM RECEIVERS

Most of the good imports have one or more short-wave bands in addition to the regular AM and FM bands. The audio sections of these receivers are well designed—most employ multiple-speaker systems—and provide excellent audio quality. Classified generally as table models, the sets in CR's test were considerably larger than any offered as table radios by United States manufacturers. The cabinets were in all instances about 24 inches long by 16 inches high by 10 inches deep.

One important shortcoming of the foreign receivers is related to servicing, and the matter of availability of parts if needed. It will probably take a good deal of effort for the owner of one of these sets to find a serviceman outside a big city who would know how to proceed and would be willing to repair one of these sets.

All the sets tested were made in West Germany. Ratings are cr56.

A. RECOMMENDED

Grundig-Majestic 3035 W/3D/USA (Majestic International Corp., 79 Washington St., Brooklyn 1, N.Y.) $170. AM, FM, and short wave. Set had 5 tubes plus one tuning-eye tube and a selenium rectifier. Cabinet of good construction and finish. Had separate bass and treble tone controls, good. AM sensitivity, good; short-wave sensitivity, good; selectivity on AM and short wave, relatively good; FM sensitivity, good. Tonal quality from four speakers, judged good. 2

Siemens Luxussuper 54-1135W (Siemens New York, Inc., Empire State Bldg., 350 Fifth Ave., New York 1) $249. AM, FM, and short wave. Set had 9 tubes plus one tuning-eye tube and a selenium rectifier. Cabinet of good construction and finish. Had separate bass and treble tone controls. AM sensitivity, good; short-wave sensitivity, good; selectivity on AM and short wave, relatively good; FM sensitivity, good. Tonal quality from two speakers was judged good. 3

Telefunken Opus 7 (Distributed by American Elite, Inc., 7 Park Ave., New York 16) $270. AM, FM, and long and short wave. Set had 8 tubes plus tuning-eye tube and a selenium rectifier. Cabinet of good construction and finish. Had separate bass and treble tone controls. AM sensitivity, good; short-wave sensitivity, fair; relative selectivity, good; FM sensitivity, good. Tonal quality from six speakers, very good. 3

▶ **REF:** Bulletin, Aug. '56.++

RADIO-PHONOGRAPHS

One possible way to obtain a combination (assembled) receiver and record player which could be said to offer reproduction approaching high-fidelity quality is to pay a price on the order of $500 or higher, and even then, with rare exceptions, the combination will be in the medium-fidelity class, rather than high-fidelity. While there is a demand for combinations, there are few who are willing to pay the high price and allot the considerable space required for a good one. For that reason CR has not included combinations in its testing program.

The best way to obtain the advantages of the combination radio-phonographs is to assemble a system of separate components (see "High-fidelity" section). CR advises against spending money and time to convert or modify an existing radio-phonograph combination of early vintage to give high-fidelity reproduction.

"ALL-WAVE" RADIOS

An all-wave receiver covers not only the AM broadcast band but usually all important radio bands up to 40 megacycles. The following characteristics are needed in an all-wave receiver: (1) A tuned radio frequency stage is necessary if the set is to pick up far-distant stations. This feature also tends to reduce the number of undesirable squeaks and whistles created by stations other than the one being received. (2) Good selectivity or ability to discriminate between two adjacent stations (with this characteristic, one can expect relatively poor audio quality from an all-wave receiver). (3) "Band-spread" tuning. There is a crowding of stations in some parts of the tuning range, and it is advantageous if a certain portion of a band can be "spread" over a second fine-tuning dial.

A. RECOMMENDED

Zenith Super Deluxe Trans-Oceanic, Model L 600 (Zenith Radio Corp., 6001 W. Dickens Ave., Chicago 39) $140. Portable receiver; ac-dc-battery operation. 5 tubes plus selenium rectifier. R.f. amplifier. Sensitivity, good. Selectivity, adequate. Power output through 5½-in. speaker, good for a portable receiver. Audio response, good. ¶New model, *A600L*, at $160 appears similar. cr55 2

▶ **REF:** Bulletin, Jan. '55.+++

AUTOMOBILE RADIOS

Transistors have made possible several improvements in the performance and reliability of automobile radios. Of primary importance is the fact that the older vibrator and associated power supply circuit components, a major cause of service troubles, are eliminated. Second, even though only one transistor may be used (to drive the speaker), the current drain from the battery will be substantially less than that of a comparable all-tube radio. Thus it isn't as necessary to limit the use of your car radio when your battery is low or when you are parked. Transistors, however, do have some disadvantages. Even moderately high temperature, for example, such as would be attained in a parked car on a hot summer day may ruin them.

There are radios available, such as the *Motorola 397*, for installation by the purchaser himself. These are comparable in quality to the radios furnished already installed by the auto manufacturer. Since they are from $10 to $35 lower in cost, one can make a considerable saving by purchasing such a receiver. A regular portable radio lacks the needed sensitivity and volume of sound output to function satisfactorily in an automobile or to be used as a substitute for an auto radio.

Ratings are cr57.

A. RECOMMENDED

Motorola, Model CTA6T (Motorola Inc., Chicago 51) $70. Custom model. Five tubes and one transistor. Separate 6 x 9 in. speaker. Push-button control. Battery power drain, 25 watts. Sensitivity (ability to receive a relatively large number of broadcast stations), average. Selectivity (ability to separate two stations which are next to each other on the tuning indicator), fair. Audio frequency response, very good. Volume of sound output, below average. 3

Sears All-State, Model 528-62680 (Sears-Roebuck's Cat. No. 28—T630) $74.70, plus postage. Custom model. Four tubes and three transistors. 6½-in. speaker. Push-button control. Battery power drain, 14.5 watts. Sensitivity, below average. Selectivity, poor. Tone quality, good. Power output, excellent. 3

B. INTERMEDIATE

Motorola, Model 397 (Motorola Inc.) $40. Six tubes. 4½-in. diameter speaker. Knob control. Battery power drain, 28 watts. Sensitivity, below average. Selectivity, good. Audio frequency response, satisfactory. Power output, good. 1

Motorola, Model 596-12 (Motorola Inc.) $60. The *597-12* is similar. Six tubes. Separate 6 x 9 in. speaker. Battery power drain, 25 watts. Sensitivity, average. Selectivity, fair. Audio frequency response, good. Power output, good. 2

Ford, Model 75 BF 178569 (Ford Motor Co., Detroit) $89. Five tubes and one transistor. 6 x 9 in. oval speaker. Push-button control. Battery power drain, 24 watts. Sensitivity, average. Selectivity, good. Audio frequency response, fair. 3

* * *

The following receiver is judged less desirable in several respects than the other automobile radios tested.

Sears All-State (Sears-Roebuck's Cat. No. 28—06330) $37, at retail store; $34.65, plus postage, through catalog. Five tubes. (No radio-frequency amplifying stage.) 4 x 6 in. speaker. Battery power drain, 30 watts. Sensitivity, average. Selectivity, good. Relatively poor audio listening quality. Power output, fairly good. 1

▶ **REF:** Bulletin, Aug. '57.+++

TELEPHONE ATTACHMENTS

Though the American Telephone and Telegraph Co. and its associated companies have hitherto forbidden the use of telephone attachments not furnished by them or sanctioned by them, the company's position was not sustained in a suit brought by the Hush-A-Phone Corp., which has won a court decision allowing their telephone attachment to be used. (Normally, written permission should be obtained from the telephone company before using any attachment on a phone.)

A. RECOMMENDED

Twinfone Multiple Listening Attachment (Manufactured by Telephone Devices Co., Inc., Lynbrook, N. Y.) $3. Special earpiece, which snaps on receiver of a telephone, picks up a part of the incoming sound which is then conducted through a rubber connecting tube to another earpiece, so that a second person can listen.

B. INTERMEDIATE

Hush-A-Phone, Model F-1, Telephone Attachment (Manufactured by Hush-A-Phone Corp., 65 Madison Ave., N. Y. C.) $10. Confines the spoken voice to the phone to eliminate background noises and to keep conversation from being overheard by those not participating in it.

▶ **REF:** Bulletin, Feb. '55.+++

Laundry supplies

How to wash • water softening • laundry detergents
bleaches • starches • fabric softeners

HOW TO WASH

Certain steps must be carried out in laundering to assure good results. Successful laundering involves the following:

Sorting

Articles to be washed should be grouped into separate loads according to washing temperature, washing time, detergent, and colors. Typical loads may be as follows:

1. Fine fabrics.
2. White and light-colored fabrics (fast dyes).
3. Dark-colored fabrics (fast dyes).
4. Fabrics with colors that are not fast.

Preparation

Remove perishable trimmings; take out shoulder pads; close all fasteners; tie belts, strings, shirt and blouse sleeves in loose knots; empty pockets; remove lint and tobacco from cuffs and pockets.

Water temperature

While hot water, 140°F or hotter, is efficient in removing soil, dirt, and grease, fibers such as wool, silk, synthetics, and non-colorfast articles are likely to be damaged or greatly wrinkled by hot water. Clothes washed in cold water, while less wrinkled, are not cleansed as effectively.

Washing temperatures, in degrees F up to which various fibers can be washed safely

White cotton, Orlon, rayon, Dynel, Acrilan; linen; also Celaperm or Chromespun acetate	160
Colored cottons, rayon; nylon	100-120
Colored Acrilan, Dynel, Orlon; acetate; Fiberglas (wash by hand); Dacron; silk; wool	100

Use of soft water

Soap and synthetic detergents are more effective in soft water. This is particularly true of soap, which combines with the minerals in hard water and forms an insoluble soap as curd-like particles. This insoluble soap causes white fabrics to turn gray, dulls colors, may cause clothes to turn brown when ironed, and makes fabrics harsh and stiff. Soft water should be used for rinsing as well as washing. (See "Water softening," page 38.)

Use of detergents

Detergents give water greater power to penetrate fabrics; to loosen the soil, dirt, and grease; and to keep the soil suspended in the solution so that it is not redeposited on the fabric. Select the right kind of soap or synthetic detergent and use the proper amount by measuring, not pouring. The correct amount will depend on the type of wash, hardness of water, and type of washing machine. (See "Laundry detergents," page 40.)

Additional steps (optional)

Bleaching. Bleaches help retain or restore the whiteness of fabrics and remove stains not removed by washing. After using a chlorine bleach, rinse thoroughly. Follow manufacturer's directions closely. (See "Bleaches," page 41.)

Bluing. Bluing gives the appearance of whiteness to cottons and linens. Bead and flake bluings are for use in the wash water, solid and liquid bluings for use in final rinse.

Starching. Starching will yield a firmer fabric with a smooth finish and help in the removal of soil in subsequent laundering. Avoid the use of too much—follow manufacturer's directions for satisfactory results. (See "Starches," page 42.)

WATER SOFTENING

Certain minerals in hard water (calcium and magnesium) combine with soap, and to a much lesser degree with synthetic detergents, to form gray, curd-like particles called "insoluble soap" or "lime soap." These particles are responsible for the ring around the bathtub, the cloudy stain on glassware, the dullness of colored fabrics, and the gray appearance of white fabrics, and for the larger amounts of detergent needed for effective removal of soil. Soft or softened water does not contain hardness-producing minerals.

Classification of soft and hard waters

Hardness of water is expressed in terms of equivalent calcium carbonate content given in grains (weight of the mineral content) per gallon or parts per million of calcium carbonate. (For easy conversion, one grain is very closely equivalent to 17 parts per million.)

Classification	Grains per U.S. gallon	Parts per million
Zero soft water	0	0
Moderately soft	0 to 3	0 to 51
Moderately hard	3 to 7	51 to 120
Hard	7 to 12	120 to 205
Very hard	12 to 50	205 to 855

Water-softening equipment

Equipment sold for softening hard water in the home uses certain insoluble chemicals which replace the calcium and magnesium in the water with sodium. Water so treated is not free of minerals, but the chemical constitution of the water is changed so that sodium prevails instead of calcium and magnesium. The equipment produces softened water until the sodium in the chemicals becomes exhausted, and then by simply flushing the chemicals with a salt solution they become "regenerated" and once again act to soften the water. The process of regeneration must be done regularly as the chemicals become exhausted.

Water-softening equipment is priced from \$200 to \$1000, plus installation; it can also be rented for several dollars a month with local service—which includes regular visits from a serviceman who will replace the spent unit with a freshly charged one—or the homemaker can, if she prefers, take full responsibility for maintenance of the equipment. The rental-service combination not only avoids the need for a large capital outlay but eliminates personal responsibility for maintenance of the system.

In selecting a water-softening unit, the homemaker should first have the water analyzed so that the manufacturer of the softening equipment can determine what type of softening agent to use and what treatment of water beyond softening, if any, may be needed. To pick the right size, one must know the following:
(1) How hard the water is; (2) how much water will be used daily; (3) how long the softener is expected to operate before regeneration.

Water consumption varies from family to family, depending on what type of water-using appliances will be used, how many baths will be taken, how much laundering will be done, etc. An average estimate for daily consumption per person living in the house will range from 25 gallons to 40 gallons. This does not include water closets, which will normally use untreated water, or water for drinking, cooking, or for sprinkling garden or lawn; it is important that these should *not* be treated. In general, a softener should be of such capacity that it will not be necessary to regenerate oftener than every two or three weeks.

A few tips about water containing sodium

Unusually large and frequent doses of salt-water waste discharged into a septic tank may cause serious interference with its operation.

Any person who is on a salt-free or a low-salt diet should not drink water which has been softened by the usual method, involving addition of a sodium compound. Sodium, in the body, tends to hold water in the tissues, and any person who has a heart disease or high blood pressure should prevent excessive water retention by keeping his sodium intake from every source under strict control.

Use of water that has been softened impairs the flavor of coffee, and accordingly, unsoftened water, or naturally soft water, if available, should be used.

Water containing sodium should not be used for watering plants, lawns, gardens, or to supply aquariums. *For these reasons it is advisable to provide a special tap or taps from which one can draw untreated water.*

On water to be used in steam irons, vaporizers, sterilizers, or bottle warmers, see "Demineralizers," below.

Caution

Soft water is more corrosive to piping than is hard water. This applies to copper as well as steel, and very particularly to lead piping; there should be no lead in any system that provides drinking water, for passage of water for drinking or cooking through lead pipe may result in an exceedingly serious health hazard. The danger is greatest with soft water, as the amount of lead dissolved in water is increased greatly with soft water.

▶ **REF:** Bulletin, Feb. '53.++

Chemicals for softening water

Some packaged chemical softeners form a precipitate; others do not. Both kinds can be bought in grocery, hardware, department, or drug stores.

Softeners that form a precipitate combine with the hardness minerals in a way that gives the water a cloudy appearance. Such water softeners are alkaline and should be used in the correct amounts and with care to avoid damage to clothing—particularly articles made of silk, acetate, and wool. Examples of such chemical softeners are: *Climalene, Mel'o, Raindrops,* trisodium phosphate, sal soda, and washing soda.

Softeners that do not form a precipitate "tie up" or sequester the hardness minerals so that detergents cannot combine with them; with use of this type, the water remains clear. These compounds are either neutral or mildly alkaline in solution and are not likely to be harmful to the hands or fine clothing. Examples are: *Calgon, Noctil, Phosphotex,* and *Tex.*

Demineralizers

Water which is used in steam irons, automobile batteries, vaporizers, sterilizers, and bottle warmers, for example, should be free from minerals and salts. Distilled water is, of course, suitable but not always conveniently available. For the purposes mentioned, a demineralizer, which can be bought at a hardware or department store, is a satisfactory substitute—it converts tap water into mineral- and salt-free water as it is needed.

The cost of demineralized water will vary with the hardness of the tap water but generally will run to about 10 to 20 cents a gallon.

A. RECOMMENDED

Chemi-Filter, Model A-8 (The Kutlir Labs., Monmouth Junction, N.J.) Complete unit, $1.69; refill cartridge, 85c. Was convenient to use and produced water of good quality.

Deeminac, Model 16-4 (Crystal Research Labs., Inc., 29 Allyn St., Hartford 4, Conn.) Complete unit, $3; refill cartridge, *Model F-4,* $2.25. Was convenient to use and produced water of satisfactory quality. The *Deeminac* was particularly handy for directing flow of purified water, into a small opening, for example, of a steam iron.

B. INTERMEDIATE

Cul Dew Water Refiner (Culligan, Inc., Northbrook, Ill.) Complete unit, $2.29. Quality of water, variable, depending on speed at which water flowed from bottle.

Deeminac, Models 6-2 and 6-2A (Crystal Research Labs., Inc.) Complete unit, *6-2,* $1.75 with one refill; complete unit, *6-2A,* $3 with two refills; refill cartridge, *F-2,* $1.25. Quality of water, variable, depending on speed at which water was removed from bottle.

Quickpure, Cat. No. 30 (Comroe Labs., Inc., 5208 South Lake Park Ave., Chicago 15) Complete unit, $1.59; refill cartridge package (2), $1. Quality of water, variable, depending on speed at which water was removed from bottle.

Wantz Kleensteam conditioner, No. FS-100 (Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.) Complete unit, 98c; refill cartridge package (2), 98c. Produced water of good quality, but operation was extremely slow after resins became wet; a half hour or longer was required to make a pint of demineralized water, although manufacturer's literature claimed a pint could be made in 4 to 5 minutes.

Faucet water-softening units

Water-softening devices intended to be attached to the faucet have little working water-softening capacity and cannot be considered practical. Such devices do not soften the water effectively and are uneconomical compared with equipment designed for softening the general household water supply.

"Water conditioners," so-called

Any device claimed to treat water simply by installing it in or attaching it to the water service piping and requiring no maintenance or replacement of chemicals does not soften the water or improve its quality in ways measurable and verifiable by the chemist. *Unless the device changes the water chemically* in ways clearly stated, the homemaker need not give it serious consideration. The same applies to water treatment or conditioning devices using a dry battery or intended to be connected to an electric power receptacle as a source of energy.

▶ **REF:** Bulletin, Aug. '53.

Hard-water test kits

Homemakers can test the hardness of their water quickly and conveniently with a test kit. One such kit is available which contains sufficient amounts of the chemical solutions for a great number of tests, is easy to use, and indicates the hardness of the water being checked by a simple color change in about 1 to 2 minutes.

Calgon Speedy-Kit (Calgon, Inc., Pittsburgh 30) $3.50.

▶ **REF:** Bulletin, Dec. '53.++

LAUNDRY DETERGENTS

A detergent is any product which loosens and carries away soil from fabrics and surfaces. Soap is one kind of detergent and synthetic detergents are another kind. While many manufacturers of detergents do not give specific information on their packages for the use of their products, the consumer will be wise to follow as closely as possible the instructions that are given.

Soap

In soft water, soaps are generally superior for laundering cotton, viscose rayon, nylon, glass fibers, and silk. Soaps are generally less irritating to one's skin than synthetic detergents and are more easily rinsed out of clothing. They will, however, combine with minerals in untreated hard water and form insoluble soap as curd or scum. Soaps form suds, which can be used as a guide in determining the correct amount to use. They perform well in an agitator washing machine but are best not used in a rotating-cylinder-type machine. Soaps can be bought for light- or heavy-duty washing and are so classified.

Light-duty. These are intended for hand or machine washing of fine and colored fabrics or garments of delicate construction.

Chiffon Flakes
Ivory Snow
Ivory Flakes
Kirkman Flakes
Lux
Nola

Heavy-duty. Most of these products contain special "builders" to help to remove soil quickly. They are intended for washing in a washing machine and for all-purpose cleaning.

American Family
Cul
Duz
Fels Naptha
Gold Dust
Rinso
White King

Synthetic

These compounds do not react with the minerals in water as do soaps and hence are especially adaptable for use with hard water. Synthetic detergents are superior for laundering wool, acetate garments, and for the removal of greases and oils. Among the variety of synthetic detergents available for home use, the type producing minimum suds is most suitable for use in a rotating-cylinder-type washing machine. Synthetic detergents, like soaps, are classified for light or heavy duty.

Light-duty. All synthetic detergents in this group produce suds. They are intended for washing fine and colored fabrics and for washing dishes by hand.

Granules

Dreft
Trend
Vel

Liquids

Chiffon
Fels
Glim
Joy
Lux
Trend
Vel
White King

Heavy-duty. These contain special "builders" for quicker removal of heavy soil and greater ability to cleanse dirty or greasy fabrics. They are intended for laundering and all-purpose cleaning. These detergents produce heavy suds and are not suitable for use in a rotating-cylinder-type machine or washer-dryer combination.

Granules (sudsing)

American Family
Breeze
Cheer
Duz
Fab
Felso
Kirkman
Oxydol
Rinso
Surf
Super Suds
Tide
White King

Liquids (sudsing)

Biz
Wisk

Granules (low-sudsing)

Ad
All
Dash
Fun
Spin

Liquid (low-sudsing)

Hum

Ratings of synthetic detergents

A. RECOMMENDED

Light-duty

Dreft • Glim liquid • Ivory liquid • Vel liquid.

Heavy-duty

Breakwater • Fab • Kirkman • Oxydol • Rinso • Super Suds • Surf • Tide.

B. INTERMEDIATE

Light-duty

Trend

Heavy-duty

Ad • All • Biz liquid • Breeze • Cheer • Sail • Dash • Wisk liquid.

SOAP FOR WASHING WOOLENS

A. RECOMMENDED

Woolite (East Honey Harbor, Inc., N.Y.C.) $1.50 for 1-lb. can. Intended for washing in cold water.

BLEACHES

Don't use a bleach until you have read and understood the manufacturer's directions. Bleaches differ in their ability to bleach, but some, like the chlorine bleaches, can damage fabrics if not used properly or if too much is used. A bleach should be used to remove stains and to retain whiteness of fibers, not as a substitute for a detergent for the removal of dirt. To provide the safest and most effective use of bleach, it should be added to and mixed with the wash water before the clothes are introduced. The water temperature should be about 140 to 160°.

Some cotton fabrics sold as "wash and wear" may have been treated with a resin finish which when washed in a chlorine bleach will turn yellow and become damaged when heated, as in ironing. Articles that may have been treated with this type of resin are men's shirts, dresses, curtains, drapes, trimmings, and uniforms.

Do not use a hypochlorite bleach, such as *Clorox*, or *Purex*, with household ammonia or *Sani-Flush*, for dangerous gases are given off when these materials are mixed. The same danger may arise if a rust remover is used at the same time with a bleaching compound. Chlorine bleaches can injure, dull, or roughen porcelain surfaces of sinks, lavatory bowls, and laundry tubs if not used with extreme care.

Liquid bleaches

1. Sodium hypochlorite (more commonly known as a chlorine bleach)—rapid in action, works well on white cottons and linens, but is destructive to animal fibers (wool, silk), unsuitable for colored fabrics, fabrics having certain wrinkle-resistant finishes (such as *Everglaze, Tebilized, Good Behavior,* and glazed chintz), and must not be used on stains due to rust. Examples of hypochlorite bleaches: *Clorox, Dazzle, Hi-lex, Purex, Rose-X, Speedup, White Sail.*

2. Hydrogen peroxide—a material that can be used with reasonable success for bleaching silk, wool, and colored fabrics, but it is not effective on fruit stains. It deteriorates in storage. Hydrogen peroxide is sold at drug stores.

Powdered bleaches

1. Sodium perborate—a relatively slow-acting bleach suitable for use on wool, silk, cotton, linen, and synthetic fibers. Examples: *Dexol, DuPont All Fabric, Glo, Safety, Snowy, Vano.*

2. Calcium hypochlorite—a chlorine bleach in dry, granulated form similar in action to sodium hypochlorite liquid bleach. Example: *Purex.*

3. Dichlorodimethylhydantoin (DDH) — a heavy-duty bleach which slowly produces sodium hypochlorite in water. Examples: *Hi-lex, Pruf, Purex Beads-o'Bleach, Sage.*

Optical bleaches

Most soap and synthetic detergent products nowadays contain a fluorescent dye, also known as optical bleach. Some laundry bluings and bleaches also contain these dyes. Dyes of this type impart a fluorescent blue-white cast which gives white fabrics a whiter and colored fabrics a brighter appearance. (Under artificial light or on a cloudy or hazy day, the effect of the fluorescent dye may be slight or unnoticeable.) Optical bleaches can also be bought in package form. Examples of some are: *Jiffy, Pro-nyl, Nylonu.*

HOW TO WHITEN

discolored nylon garments

The following procedure is outlined by duPont:

1. Wash the garments thoroughly with soap or synthetic detergent by hand or in a household washer, depending on the construction and type of the garment.

2. To approximately one gallon of hot water (160°F) in an enamelware container, add one package of *Rit Color Remover* and immediately add the wet garments. Stir gently, while maintaining the temperature. If after 30 minutes whiteness is restored evenly, remove the garments and rinse *thoroughly* in hot water. If whiteness was not restored, let the garments soak for 30 minutes longer. The temperature should not exceed 160°F, as too high temperature may set wrinkles so that they would be difficult to remove by ironing.

3. To approximately one gallon of warm water, add two tablespoons of *Clorox* and two tablespoons of a synthetic detergent. Immerse the garments and, with occasional stirring, let them soak for 30 minutes. Rinse *thoroughly* in warm water.

4. For the final rinse, immerse the garments in approximately one gallon of warm water containing a tablespoonful of an optical whitener such as *Jiffy*, *Pro-nyl*, or *Nylonu*.

Drip dry and iron with a steam iron or a dry iron at "rayon" setting. Any precautions recommended by the manufacturers of any of the four types of products used should be followed. It is important to follow the steps in the order given, but many garments may not need all the steps for satisfactory results.

STARCHES

Starches can be used to give fabrics a smooth finish, more substance, and to help in the removal of soil in laundering. Even such items as bed linens, tablecloths, and napkins can be satisfactorily starched when starch is used sparingly, to give a hint of crispness.

Three basic types

The homemaker can choose from among three types, vegetable, plastic, and "CMC"-based — each providing certain characteristics.

Vegetable

This is the most common type, also known as cornstarch, and is applied after each laundering. It can be bought in either dry or liquid form. Dry starch comes in lump, cube, or powdered form. Familiar brands of dry starches are *Argo, Cameo, Elastic, Faultless, Linit, Niagara,* and *Staley's;* some of these can be mixed quickly in cold water. Liquid starch is made from the same basic ingredient as dry starch and needs only to be diluted with cold water. *Linit, Rose-X, Sta-Flo,* and *Zippy* are well-known brands.

Plastic

These are sold in liquid form. Unlike vegetable starches, they are not as readily removed from fabrics and only occasional starching is required. Depending on the concentration used, the finish will usually last through several launderings. One major drawback with the plastic starch, however, is the difficulty of maintaining a uniform or desired crispness in a garment from one washing to the next. Because plastic starch is difficult to remove from fabrics, care should be taken to adjust the strength of the solution to the type of fabric and the stiffness desired. Some formulations have resulted in yellow streaks on white clothes or white spots on dark clothes.

"CMC"-based

Sodium carboxymethyl cellulose—commonly abbreviated to CMC—is actually not a starch but a finish which coats the fibers with a film to increase soil resistance without adding stiffness to the fabric. It is readily removed in washing. Most laundry detergents nowadays contain CMC, but it can also be bought as a liquid—one such is *Glosstex*.

Hints in starching

When starching dark-colored cottons, tint your starch with bluing for blues and blacks, tea for browns, and commercial tints for other colors.

When starching in a washer, put the starch in the final rinse, or after the clothes have gone through the entire wash-and-rinse cycle, by resetting the washer for the starching operation. Using the wash cycle is better than the rinse cycle, if the washer has an overflow rinse. Most washer manufacturers recommend starching at the end of the first wash load; subsequent washings will then remove the starch from the basket of the washer. If done otherwise, rinse the washer with clear water after starching. This last step is particularly important with plastic starches; unless this is done, repeated starching in a washer could cause a film of plastic to build up on parts of the machine.

FABRIC SOFTENERS

Textile or fabric softeners for home laundering impart softness and fluffiness to the fabrics; the softener forms a coating on the surface of each fiber which acts as a lubricant, permitting the strands of yarn to slip easily over each other.

A fabric softener should be added to the last rinse water, after the detergent has been rinsed from the clothes; otherwise the effect of the softener will be lost. (A softener may form a curdy precipitate with some detergents.)

The degree of softening or conditioning depends on the amount of softener used and the amount of clothes treated—dilution does not have any effect.

A softener should be added to the clothes after bluing but before starching, if either is to be used.

Fabric softeners are effective in both hard and soft water. They reduce wrinkling, matting of rugs and towels, reduce static electricity, and aid in ironing. They can be removed from clothes by washing with a soap or synthetic detergent. Brand names of some fabric softeners are: *King Fluff, NuSoft, Sta-Puf, Sunlight Downy-Dry, Sun-Soft.*

Timekeeping

WATCHES

High price and fine appearance give no assurance that a watch will be a good timekeeper. Actually, of the more than 3600 different trade and brand names, there are less than 100 different movements sold. A given movement is often used for a number of watches in a given brand, but with several names, over a range of prices.

The number of jewels is often used to justify a far higher price than a watch warrants when, in fact, the intrinsic value of the jewels is quite low, from 2 cents to 5 cents each.

A solid gold case may increase the price of the watch by $150 over stainless steel, but the bullion value of the gold in the high-priced case may be only one tenth of this extra amount.

Selecting a watch with some care can pay dividends for many years. In making a selection, the following points will help:

Avoid buying a watch of unknown brand or make, and all sorts of mail-order "bargains." It is unsafe to buy from companies that offer used or reconditioned watches.

A watch should not be bought on the strength of its being shock-resistant, shockproof, waterproof, or having an automatic-wind mechanism, or because it is of Swiss make. (Swiss watches, like those of American makes, can be very good, or very poor.) Automatic or self-winding watches are likely to require more frequent repairs and cleaning—at a higher cost in each case than with a conventional watch. The other features are very often just for sales appeal and of no particular importance to the user.

Also disregard the claim that a watch is nonmagnetic. (Most watches today are made with an anti-magnetic balance and hairspring.)

Small wrist watches will usually keep time poorly, and will need to be cleaned and adjusted oftener than the larger wrist watches or pocket watches, particularly in hot climates, near the seashore, and in places with high humidity.

Watches can be adjusted by a skilled watch repairman to keep time within these limits of accuracy: Within 1 to 2 minutes a day for a good wrist watch, the error being larger for smaller watches; within 20 to 30 seconds a day for a good pocket watch; and within 5 seconds a day for a railroad-grade pocket watch.

A watch should be guaranteed for at least a year, *by the jeweler who sells it.* (The manufacturer's guarantee is not enough.)

It is safer to buy a watch from a watch dealer or jeweler than from a department store.

In buying any watch for which a substantial price is paid, obtain a clearly and legibly written and plainly worded, dated sales slip, specifying make and number of movement, number of jewels, metal and quality of case (solid or filled, carat value), and whether the watch is new.

Men's wrist watches

Notable in the results of the last test of 13 brands of men's wrist watches was the wide range of timekeeping properties between watches of a single brand. In only four brands were the samples found sufficiently uniform in performance to warrant an *A-Recommended* rating.

A. RECOMMENDED

Croton • Girard Perregaux • Longines • Wadsworth.

B. INTERMEDIATE

Benrus • Bulova • Elgin • Gruen • Hamilton • LeCoultre • Omega • Wittnauer • Wyler.

▶ **REF:** BULLETIN, Mar. '58.++

Ladies' wrist watches

Where a dagger (†) appears in the listing, the number of samples tested was too small perhaps to afford a basis for more than a limited and tentative judgment.

A. RECOMMENDED

Bulova • Elgin • Eterna-Matic† • Longines† • Wadsworth • Westfield • Wittnauer.

B. INTERMEDIATE

Girard-Perregaux • Gruen • Hamilton • Omega • Wyler†.

C. NOT RECOMMENDED

Croton†.

▶ REF: Bulletin, Nov. '54.++

Watches, top-grade pocket or wrist (Swiss)

Anyone wanting a watch that will be something out of the ordinary in quality and willing to pay the high prices asked will be well advised to make his selection from the following list of names. Each brand has a good reputation among watch men. Those marked with a (★) have especially high repute in the watch trade.

A. RECOMMENDED

Agassiz • **Audemars Piguet★** • **International** • **Movado** • **Patek Philippe★** • **Touchon** (Div. of Longines) • **Ulysse Nardin★** • **Zenith★.**

Watch repair service

Nowadays, an overhaul will cost from about $5.50 to $12 or more, plus parts, depending on whether the watch is self-winding or has other special features. A watch that has been overhauled should be in new condition in all essential respects.

Any reliable repair job should include a guarantee for one year against troubles that may develop without fault of the user. Watch manufacturers, though charging high prices for repair jobs, will often not do better work than a local watchmaker of skill and good repute.

Buying a fairly satisfactory new 17-jewel watch (often to be had at $25 or less) may be more economical in the long run than having a used watch repaired; besides, the jeweler may reduce the price by a substantial allowance on the used watch.

ELECTRIC CLOCKS

Unless an electric clock is wanted chiefly as an ornament, the purchaser should look for certain features that will assure dependable service for years to come. Although electric clocks are short-lived compared with good pendulum clocks, many will run 20 years.

Desirable features: a prominent telltale *stoppage indicator;* minute marks, and preferably a *round* dial; mechanism as nearly as possible dustproof; a silent motor; well-proportioned, easily-seen hands; stability; protected or unbreakable "glass"; quick-acting, simple, easily turned hand-setting mechanism; soft padded feet to prevent marring of furniture, and to cut down noise; sweep-second hand as indicator of clock's running; and a metal dial.

In addition to the above, an alarm clock should have a 24-hour self-setting alarm with a cut-out that is easily reached from the front or top that indicates whether the alarm is on or off; an alarm which permits variation of loudness; an alarm dial that is easily read and set; and a time dial that is easily read in the dark.

It is important to note that the same movement is used in clocks of a given make at widely different prices; it is the differences in design and finish of the case that determine the selling price. Plastic cases are a source of weakness and may often be broken or cracked, in a year or two. It will often be better to buy a new clock rather than have an old one repaired, particularly if the clock was a low-priced one.

Power consumption of electric clocks usually ranges from to 2 to 3 watts (about 60 cents to 90 cents per year operating cost). Makes found relatively good in a test some years ago were: *GE, Sentinel, Sessions, Seth Thomas.*

NOTE ON "400-DAY" CLOCKS

Although often advertised as "precision" timepieces, many "400-day" clocks are poor timekeepers. Such clocks are often difficult and expensive to keep running and present problems in replacement of parts.

It has been found that when a clock of this type shows large variations in timekeeping with changes in temperature, replacing the pendulum suspension spring with one made of a special alloy has corrected the problem. Such springs, known as *Ni-Span C,* are obtainable by repairmen from Horolovar Co., Box 299, Bronxville, N. Y.

TIMING DEVICE

A pre-set timer that can give the signal by a stroke of a bell is a convenient and inexpensive way to announce the end of a predetermined period of time. Many stoves and ranges include such a timer, but where they do not, the investment in one will often be well worth while.

A. RECOMMENDED

Lux Minute Minder, No. 2428 (The Lux Clock Mfg. Co., Waterbury 20, Conn.) Plastic case, white with red numerals; device resembled a small clock and was designed for timing up to 60 min. Size, 3⅜ x 3 x 2½ in., with single "ding" signal, $3.95. Also *Lux Minute Minder No. 1928* priced at $4.95, which is somewhat larger and which has a longer ring.

Cleaning appliances and supplies

Vacuum cleaners • floor polishers • oven cleaners • scouring powders household gloves • miscellaneous cleaners • dust-control sprays

VACUUM CLEANERS

The present trend in the vacuum cleaner industry is to a yearly change in model number. As is the case with many other appliances, however, the changes made to produce a new model are mainly of the nature of a face lifting, which affects actual performance to a very limited extent. The older model may be retained in the line and sold at a much lower price. For that reason, it will often represent a good buy if available at a substantial discount.

The average home will be better served by two cleaners, an upright *and* a tank or canister, where the extra expenditure can be afforded.

If you must limit yourself to a single cleaner, you will likely be better satisfied overall with a good canister or tank cleaner. Such a cleaner is normally much more convenient to use with attachments for above-the-floor cleaning and is considerably more efficient in that use because of its higher suction capabilities.

Be very skeptical of any and all claims and demonstrations alleged to prove superior performance made by vacuum cleaner salesmen. Motor horsepower, revolutions per minute, and static vacuum, stressed by salesmen, *do not* determine effectiveness in cleaning. To measure this requires careful laboratory tests; it positively cannot be established by any sort of salesman's demonstration.

Consumers' Research divides the conditions under which a vacuum cleaner is used into three general classes:

In Class I, the ability to do a fast, thorough dirt-removal job on rugs in which much soil has been deeply embedded, from heavy traffic, is considered paramount.

In Class II, the over-all usefulness for all sorts of cleaning tasks, including both floor coverings and above-the-floor cleaning of curtains, sills, upholstery, etc., is considered. Convenience in use and versatility have been considered along with effectiveness and speed in dirt removal from the floor.

In Class III, the rating is on the basis of relative desirability for use in a home with expensive floor coverings, such as fine Oriental rugs. In such a home, traffic will usually be relatively light and efforts will be made to minimize the amount of dirt and grit tracked in.

In the table of ratings and in the listings of models, manufacturers, prices, and types that follow, the vacuum cleaners are arranged in *alphabetical order* (without regard to price rating or type) so as to facilitate cross reference between the ratings and the listings. All of the vacuum cleaners in CR's latest study passed satisfactorily tests for electrical safety. Prices given include cost of attachments, where available.

To help the reader select the vacuum cleaner best suited to the needs of her home, the **cleaners listed have been assigned a separate rating for each class of use.**

Ratings are cr52, 53, 55, 57.

Manufacturers, prices, and types of cleaners in table on page 46

Air-Way, Model 77 (Air-Way Branches, Inc., Toledo, Ohio) $123. Tank. 3

Apex Dyno, Model 5539 (Apex Electrical Mfg. Co., Cleveland 10) $40. Canister. 1

Apex Strato-Cleaner, Model 5555 (Apex Electrical Mfg. Co.) $150. Canister. 3

Compact, Model C-2 (Interstate Eng. Corp., El Segundo, Calif.) $140. Tank. Sold in some areas under the name of *Revelation.* 3

Eureka Super-Automatic, Model S-255 (Eureka-

RATINGS
for various conditions of use

Brand	Conditions of use*		
	Class I	Class II	Class III
Air-Way 77	B	A	A
Apex Dyno 5539	B	B	B
Apex Strato-Cleaner 5555	A	A	A
Compact C-2	A	A	A
Eureka S-255	B	C	C
Eureka 805	B	A	A
Eureka 910	A	A	A
Filter Queen 500	B	A	A
General Electric C-3	B	B	B
General Electric R-1	C	B	B
Hoover 64	A	C	C
Hoover 84	B	B	B
Kenmore 0757L	C	A	A
Kirby 514	A	C	C
Lewyt 90	C	B	B
Singer C-1	A	A	A
Universal Jet 99	B	A	A
Wards 85—396	B	B	B
Wards 85—327	B	B	B
Westinghouse DC-7	A	A	A
Wizard Deluxe	B	A	A
Wizard Imperial	A	A	A

*For explanations of classes, see preceding text.

Williams Corp., Bloomington, Ill.) $110. Upright. ¶Newer model, *260*, appears similar. 3

Eureka Roto-matic, Model 805 (Eureka-Williams Corp.) $50. Canister. ¶Newer model, *860*, appears similar. 1

Eureka Super Roto-matic, Model 910 (Eureka-Williams Corp.) $70. Canister. ¶Newer model, *960*, appears similar. 2

Filter Queen, Model 500 (Health-Mor, Inc., 203 N. Wabash Ave., Chicago 1) $169.50. Canister. 3

General Electric, Model C-3 (General Electric Co., Bridgeport 2, Conn.) $45. Canister. 1

General Electric Roll-Easy, Model V11R1 (General Electric Co.) $60. Canister. 1

Hoover Citation, Model 64 (The Hoover Co., North Canton, Ohio) $140. Upright. ¶Newer model, *65*, appears similar. 3

Hoover Constellation, Model 84 (The Hoover Co.) $70. Canister. 2

Kenmore (Sears-Roebuck's Cat. No. 20—0757L) $75, plus postage. Canister. ¶Cat. No. 20—08630L at $40 appears similar. 2

Kirby, Model 514 (The Scott & Fetzer Co., 1920 W. 114, Cleveland 2) $196. Upright. 3

Lewyt, Model 90 (Lewyt Corp., Brooklyn 11, N.Y.) $90. Canister. ¶Newer model, *93*, appears similar. 2

Singer Roll-a-Magic, Model C-1 (Singer Sewing Machine Co., Elizabeth, N.J.) $80. Canister. 2

Universal Jet 99, Model VC6710 (Landers, Frary & Clark, New Britain, Conn.) $100. Tank. ¶Current *Model 6730* at $70 appears similar. 3

Wards (Montgomery Ward's Cat. No. 85—396) $59, plus postage. Tank. ¶Cat. No. 85—397 at $50 appears similar. 1

Wards (Montgomery Ward's Cat. No. 85—327) $32.50, plus postage. Canister. Appears similar to the *Apex 5539*. 1

Westinghouse, Model DC-7 (Westinghouse Electric Corp., Springfield, Mass.) $80. Canister. 2

Wizard Deluxe (Western Auto Supply Co., Kansas City 8, Mo.) $50. Canister. 1

Wizard Imperial (Western Auto Supply Co.) $70. Canister. 2

Vacuum cleaner for light service

The following cleaner is exceptionally light in weight, with a corresponding deficiency in speed and thoroughness of cleaning.

A. RECOMMENDED

Regina Electrikbroom, Model L (The Regina Corp., Rahway, N.J.) $50. Upright cleaner using straight suction. Weight, 7 lb. Dirt-removing ability: fair for both lightly and deeply embedded soil. 2

▶ **REF:** Bulletin, Nov. '52+++, Oct. '53+++, Jan. '55+++, Sept. '55+++, Feb. '57+++.

SMALL, SPECIAL-PURPOSE CLEANERS

A. RECOMMENDED

Vacu-Mite Car Interior Cleaner (Manufactured by Craft Industries, Buffalo; distributed by New York Sales, Box 34, Bay Station, Brooklyn 35, N.Y.) $5, postpaid. Of limited use. Utilizes vacuum produced in the car engine manifold. cr57

C. NOT RECOMMENDED

Roberts Electric Vacuum Brush (Made in Japan for Fred Roberts Co., 1578 Howard St., San Francisco 3) $3. cr57

▶ **REF:** Bulletin, Aug. '57.

ELECTRIC CARPET SWEEPER

C. NOT RECOMMENDED

Davis Electro-Sweep, Cat. No. 1000 (Davis Mfg. Co., Plano, Ill.) $20. Also available from Montgomery Ward and Spiegel at $14. Failed electrical breakdown tests. cr56

FLOOR POLISHERS

Floor polishers can be used to improve the gloss finish imparted by self-polishing waxes, and many can be used to scrub floors. Some models have accessory kits which enable the user to shampoo rugs and do light sanding and smoothing with steel wool on wood floors. The arduous work in applying paste wax (the preferred kind) and in polishing and buffing is greatly reduced with a polishing machine.

The ratings that follow do not apply if the machines are to be used for scrubbing. See page 95 in the "Safety in the home" section re possible shock hazard involved in use of electrical appliances on wet surfaces.

Except for the *Johnson*, and *Beal* and *Kirby* attachments, all were twin-brush machines which polished a path about 12 inches wide and polished to within ¼ inch from a wall and 1 inch from a corner.

Except as noted for the *Kirby* and *Beal* attachments, all polishers were effective in scrubbing, polishing, and buffing, and except as noted all were easily controlled by one hand.

Ratings are cr56.

A. RECOMMENDED

General, Model T-12A (General Floorcraft, Inc., New York 14) $79.50, plus tax. Weight, 15 lb.

Regina, Model TS (The Regina Corp., Rahway, N.J.) $66. Weight, 16½ lb. ¶Newer model, *400*, appears similar.

Westinghouse, Model FP-3 (Westinghouse Electric Corp., Springfield, Mass.) $65. Weight, 16½ lb. ¶Similar to the *Regina* except for shape of motor housing. ¶Newer model, *FP-4*, appears similar.

A—

Hoover, Model 0215 (The Hoover Co., North Canton, Ohio) $70, plus tax. Weight, 13 lb.

Shetland, Model TA-15 (The Shetland Co., Inc., Lynn, Mass.) $50. Weight, 9½ lb. Did not spread paste wax as well as the other twin-brush machines, but its light weight made some users prefer it to other makes. ¶Newer model, *T-12*, appears similar.

Universal, Model 8730 (Landers, Frary & Clark, New Britain, Conn.) $70. Weight, 16¼ lb. ¶Similar to the *Regina* except for design of the handle and the shape of the motor housing.

B. INTERMEDIATE

Beal Speed Polisher (Beal Speed Polisher, Inc., 4707 S.E. 17 Ave., Portland, Oreg.) $30. Attached to tank or canister vacuum cleaner suction wand. Polished a path approximately 7 in. wide. Appliance was difficult to control. Scrubbing tests were not made.

Johnson, Model HP-54 (S. C. Johnson & Son, Inc., Racine, Wis.) $69.50. Weight, 10¾ lb. Polishes a path 8½ in. wide. Polished within ¼ in. from a wall, 2 in. from a corner. More difficult to control than the twin-brush machines. ¶Later *Model HP-57*, $67.50, appears similar.

Floor Polisher Attachment for Kirby Vacuum Cleaner (see page 46 for listing of cleaner). Effectiveness in polishing, fairly good. Polished a path 12 in. wide with 1½-in. gap in center. Brush reached within ¾ in. from wall, 1 in. from a corner. Somewhat difficult to control and noisy. Scrubbing tests were not made.

▶ **REF:** BULLETIN, May '56.+++

HOUSEHOLD GLOVES

The wearing of rubber household gloves while one is doing many of the household chores will be of great aid in preventing one's hands from becoming red, chapped, and sore.

There are a few things to remember when buying household gloves: choose them one to two sizes larger than dress gloves, avoid gloves which are excessively stiff or cumbersome, and be sure the gloves you select are long enough.

Care of gloves includes cleaning and drying the inside and outside after each use, but never dry them over heat or expose them to the sun. Gloves made of rubber will deteriorate when brought into contact with certain chemicals such as cleaning fluids, waxes, fats, oils, and acids A synthetic rubber material, neoprene, can be used safely with these chemicals.

Ratings are cr55.

A. RECOMMENDED

Lanolized Klingwell (The B. F. Goodrich Co., Akron, Ohio) 89c. Latex.

St. Regis (The Wilson Rubber Co., Canton, Ohio) 79c. Latex.

Shure-Hold (Seiberling Latex Products Co., Akron, Ohio) 49c. Latex.

* * *

Gloves of the following brands were found to have one or more minor faults and were therefore considered slightly inferior to the preceding three.

Amber-plus (Pretty Products, Inc., Coshocton, Ohio) 59c. Surgeon-type glove. Latex.

DuBarry (Made in England; available in drug, chain, and department stores) 98c. Latex.

Ebonettes (The Pioneer Rubber Co., 101 Tiffin Rd., Willard, Ohio) 69c. Neoprene.

Neo-Rex (Distributed by Rexall Drug Co.) 79c. Neoprene.

Wearever Swirl Grip (The Faultless Rubber Co., Ashland, Ohio) Montgomery Ward's Cat. No. 53—4500, 50c, plus postage; also Sears-Roebuck's Cat. No. 8—2413, 55c, plus postage. Latex.

B. INTERMEDIATE

Bluettes (The Pioneer Rubber Co.) $1.39. A neoprene glove, cotton lined.

Cyralon (The Rice Mfg. Co., Van Nuys, Calif.) 55c. Plastic, without lining.

Playtex (International Latex Corp., Playtex Park, Dover, Del.) 89c. Latex, fabric lined.

Defender (Distributed by Rexall Drug Co.) 79c. Latex.

Krinkletex (The Surety Rubber Co., Carrollton, Ohio) 59c. Latex.

Super Ebonettes (The Pioneer Rubber Co.) 98c. Neoprene, fabric-like lining.

Turn Cuff (The Surety Rubber Co.) 59c. Latex.

U.S. Royal Nailgard (U.S. Rubber Co., Providence, R.I.) 69c. Latex.

Velva-Tex (The Faultless Rubber Co.; Sears-Roebuck's Cat. No. 8—2416) 2 pairs, $1.59, plus postage. Latex, fiber-like lining.

C. NOT RECOMMENDED

Lindaline Micro-Crinkle (Pretty Products, Inc.) 69c. Latex.

Playtex Mitt (International Latex Corp.) 79c. Latex.

Special mitt

B. INTERMEDIATE

Rub-a-Dub Mitt (Dean-Vail Corp., 175-177 Putnam, Paterson 4, N.J.) $1.35 for single mitt. "Hand-Washboard" mitt. Stiff plastic material. Low in tensile strength. Not considered practical as a household glove. Made in one size only, which would fit most women's hands.

▶ **REF:** Bulletin, Feb. '55.+++

DISHWASHING DETERGENTS

A common mistake made in washing dishes, either by hand or by machine, is the use of too much detergent. Only a certain amount of the detergent is useful in performing the cleansing action; any excess is not only wasteful, but it makes it more difficult to rinse the dishes properly. Using an excessive amount of synthetic detergent in washing dishes by hand can be a cause of irritation of the skin, or dermatitis.

For machine dishwashing, there are a number of detergents specially formulated. On the whole, these are strongly alkaline and should not be used for washing dishes by hand. Several of them, such as *Cascade, Finish*, and *Thanx*, are designed to minimize spotting and staining on glasses and dishes. They should, however, be used with discretion because of their strong action and the possibility of causing corrosion. Difficulties are likely to arise particularly with earthenware dishes, dishes that have overglaze decorations, stainless-steel ware, and aluminum.

One manufacturer of silver flatware recommends that silverware washed in an automatic dishwasher should preferably be removed immediately at the conclusion of the rinse cycle and dried immediately by hand.

OVEN CLEANERS

Cleaning an oven fairly often will make each job easier, particularly if it is done before the accumulation becomes thick and hard. No method or cleaner eliminates the hard work completely as advertising tends to imply, but the more effective oven cleaners do help make the job easier.

When using an oven cleaner, particlarly one of those based on strongly alkaline chemicals, one will be wise to wear household gloves. Do not let the cleaner come into contact with linoleum or other floor covering or finishes, enameled surfaces of a refrigerator, kitchen cabinets and the like, or clothing. It is also important to follow the instructions carefully and completely.

Keep such cleaners out of the reach of children at all times. The odor of the cleaners was judged not objectionable unless stated otherwise in the listings.

Ratings are cr57.

A. RECOMMENDED

de-GREASE-it (Meirett Inc., P.O. Box 361, Danbury, Conn.) 16-oz. jar, 98c. Effectiveness in removing grease, good. Thick paste ("dry" and similar in consistency to tooth paste), somewhat difficult to spread for effective cleansing. Recommended waiting time, 30 min. Unpleasant odor.

Easy-Off (Boyle-Midway Inc., Cranford, N.J.) 16-oz. jar, 98c. Effectiveness in removing grease, good. Paste, of good consistency, spread easily and covered well. Recommended waiting time, 2 to 3 hr. Unpleasant odor.

E-Z-EST (E-Z-Est Products Co., 2528 Adeline St., Oakland 7, Calif.) 9-oz. jar, 69c. Effectiveness in removing grease, good. Thick paste, and like *de-GREASE-it*, somewhat difficult to spread. Recommended waiting time, 30 min.

ITS Oven Cleaner (Earl Grissmer Co., P.O. Box 5992, Indianapolis) 16-oz. jar, $1. Effectiveness in removing grease, good. Paste, of good consistency, spread easily and covered well. Recommended waiting time, 2 to 3 hr. Unpleasant odor.

Korex Oven Cleaner (The Korex Co., 523 W. Nine Mile Road, Ferndale 20, Mich.) 17-oz. jar, 98c. Effectiveness in removing grease, good. Paste, of good consistency, spread easily and covered well. Recommended waiting time, 1 or 2 hr. Unpleasant odor.

Lewal's Oven Cleaner (Lewal Industries, Inc., 114 E. 32 St., New York 16) 16-oz. jar, 98c. Effectiveness in removing grease, good. Thin paste, easily spread, but tendency to run made it difficult to cover the surfaces. Recommended waiting time, 2 hr. Unpleasant odor.

Quick 'n BRITE (My-Ko Chemical Corp., 1255 N. Sixth St., Milwaukee 12) 16-oz. jar, 98c. Effectiveness in removing grease, good. Paste, of good consistency, spread easily and covered well. Recommended waiting time before removal, 1 to 2 hr. No odor.

* * *

Easy-Aid (G. N. Coughlan Co., 29 Spring St., West Orange, N.J.) 16-oz. jar. 98c. Effectiveness in removing grease, fair. Paste, somewhat thick, spread fairly easily and covered fairly well. Recommended waiting time, 10 to 30 min. Worked better when allowed to stay on the surface 1 hr. or more. When the recommended waiting time was used, *Easy-Aid* did not remove grease as well as other cleaners listed under *A. Recommended.*

C. NOT RECOMMENDED

All of the following five were relatively ineffective in removing grease unless the surface was rubbed with steel wool. The four spray-on cleaners all had objectionable odors.

Hep Safe-T-Spray (Bostwick Laboratories, Inc., Bridgeport 5, Conn.) 12-oz. spray-on can, $1.49.

Krust-Off (Bandwagon Mfg., Inc., 409 Summer St., Boston 10) 12-oz. spray-on can, 90c.

Sea Spray (O-Cedar, Div. American-Marietta Co., 2246 W. 49 St., Chicago 9) 12-oz. spray-on can, $1.49.

Spee-Dee (DeMert & Dougherty, Inc., 3001 W. 47 St., Chicago 32) 6-oz. spray-on can, 89c.

Gumption (Made in England; distributed by Irval Associates, 23 Bridge St., New York 4) 12-oz. can, 98c. This was an abrasive paste.

▶ **REF:** BULLETIN, Mar. '57.+++

SCOURING POWDERS

Repeated use of harsh abrasives on porcelain-enamel and vitreous china surfaces, such as are found on sinks, lavatories, bathtubs, toilet bowls, and some washers, dryers, and refrigerators, will leave an infinite number of tiny scratches which will in time dull the glossy, smooth finish. Once the surface of a fixture has been scratched, it becomes increasingly difficult to remove dirt and stains, and finally one must resort to one of the harsher abrasive cleansers in order to get the surface clean.

New surfaces can be cleaned by washing with warm water to which a soap or synthetic detergent has been added; in hard-water areas, synthetic detergents work better. If it becomes necessary to remove stubborn dirt or stains that cannot be washed off with a detergent solution, use a mild scouring powder—but limit its use to that particular occasion.

The use of an abrasive cleanser or scouring powder on baked-on enamel, found on refrigerators, freezers, washers, dryers, and other appliances should be avoided; it could soon wear through the thin enamel coating to the metal beneath.

Ratings are cr58.

A. RECOMMENDED

Bon Ami (The Bon Ami Co., 17 Battery Pl., New York 4) 14c for 12 oz. (18.7c per lb.). 3

B. INTERMEDIATE

The following contained abrasives too harsh for new porcelain (vitreous enamel) finishes, and are not recommended for use on smooth or finely finished surfaces of any kind.

Bright Sail (Distributed by The Great Atlantic & Pacific Tea Co., N.Y.C.) 8c for 14 oz. (9.1c per lb.). 1

Speedup (Distributed by American Stores Co., Philadelphia) 10c for 1 lb. 2 oz. (8.9c per lb.). 1

Babbitt's (B. T. Babbitt, Inc., 386 Fourth Ave., N.Y.C.) 9c for 14 oz. (10.3c per lb.). 2

Bab-O (B. T. Babbitt, Inc.) 16c for 1 lb. 5 oz. (12.2c per lb.). 2

Blue Dutch (Purex Corp., Ltd., 9300 Rayo Ave., South Gate, Calif.) 15c for 1 lb. 6 oz. (10.9c per lb.). 2

Kirkman (Colgate-Palmolive Co., 300 Park Ave., N.Y.C.) 10c for 14 oz. (11.4c per lb.). 2

Kitchen Klenzer (Fitzpatrick Bros. Inc., 1300 W. 32 Pl., Chicago) 9c for 13 oz. (11.1c per lb.). 2

C. NOT RECOMMENDED

The following three scouring powders produced severe scratching on glass surfaces.

Ajax (Colgate-Palmolive Co.) 17c for 1 lb. 5 oz. (12.9c per lb.). 2

Cameo (Cameo Corp., Chicago 32) 10c for 14 oz. (11.4c per lb.). 2

Comet (Procter & Gamble Co., Gwynne Bldg., Cincinnati) 22c for 1 lb. 5½ oz. (16.4c per lb.). 3

▶ **REF:** BULLETIN, June '58.+++

DUST-CONTROL SPRAYS AND CLOTH

How often the furniture and floors in a home will need to be dusted depends, in large part, on how much or little of the dust present, both airborne and settled, is actually collected and removed during the dusting operation. More efficient removal of dust can be accomplished by use of an effective dust-control spray, which will also diminish the amount of dust stirred up by sweeping, dry mopping, vacuum cleaning, and use of a carpet sweeper.

Ratings are cr54, 56.

A. RECOMMENDED

The following two were found effective in settling airborne dust and in collecting settled dust.

Endust (The Endust Corp., 418 Sixth N.W., Washington, D.C.) $1.79 for 10½ oz. Contained light mineral oil in propellant vapor.

Formula 92B (Formula Floor Products, Inc., 103 Elizabeth Ave., Newark 8, N.J.) $1.79 for 12 oz.

B. INTERMEDIATE

Dust-Off (Ade-O-Matic Co., Wrigley Bldg., Chicago 11) $1.29 for 11 fl. oz. Not as effective as *Endust* and *Formula 92B* in settling and collecting dust. The polyethylene squeeze bottle did not release the solution in a fine enough spray, and the nozzle tended to drip.

C. NOT RECOMMENDED

Conniver (Madison House, 40 Fargo St., Boston 10) $2 for 12 x 18 in. cloth, "standard" size.

▶ **REF:** BULLETIN, July '54++, Sept. '56++.

RUG CLEANERS

The work involved in caring for and maintaining carpets and rugs has increased greatly in recent years owing to changes in family habits and increased popularity of pets in the home. Today, families often eat in the living room before their television sets; thus areas of the rugs become soiled from spilled food and there is crushing and wear of the rug surfaces by the heavy traffic between the television set and the favorite chairs.

Much can be done to minimize general soiling and wear of rugs by cleaning them daily either with a carpet sweeper or lightly with a vacuum cleaner, and then by a thorough vacuum cleaning once or twice a week, whichever is necessary. Stains and spillage should be removed as promptly as possible. A thick rug or carpet at the door will help greatly in reducing the spread of dirt, mud, and grit from shoes.

For removing water-soluble spots and stains, synthetic detergent cleaners are generally more effective than the powder-type or the sawdust-based cleaners. Cleaners containing soap should not be used, for residues from soap make a rug susceptible to resoiling, and the residues will turn rancid in time and have an unpleasant odor.

Do not use ammonia as a cleaning agent, for it may injure rugs and carpets.

Ratings are cr52.

B. INTERMEDIATE

Glamorene (Jerclaydon, Inc., Miami Beach, Fla.) $2.29 for ½ gal., $3.79 for 1 gal. A long-handled rug brush to be used in applying *Glamorene* sells for $1.24. Cleaned and brightened the surface of rugs; a good grease remover, but failed to remove or lighten many water-soluble stains. Some oil or grease spots reappeared several times on carpets as the oil "wicked up" through the carpet pile. Because of content of volatile solvent, should be used *only in a well-ventilated room* (not just a room with a door or window open).

Glamur (The Hosid Products, Inc., Hosid Bldg., Syracuse 3) 89c for 8-oz. bottle. Cleaned and brightened soiled surfaces and was a good spot remover, but did not remove a heavy grease stain. Was more effective on water-soluble stains than *Glamorene*.

CLEANING DEVICES
of various sorts

A. RECOMMENDED

Golden Fleece Pot Cleaner and Scour Cloth (Metal Textile Corp., Roselle, N.J.) 10c. Fabric coated with an adhesive carrying angular grains of quartz, for scouring pots and pans. Would mar the surfaces of highly polished cooking ware or utensils, or of a kitchen counter top and should not be used on enamelware or other finely finished surfaces such as vitreous enamel, stainless ware, or chrome trim on stoves.

Golden Wand (Distributed by Empire Brush Works, Inc., N.Y.C.) $1. A clothesbrush with fine brass wires for bristles, found to be effective in removing lint from woolen garments, hats, or automobile upholstery; also effective in reducing pilling of sweaters made from *Orlon* or nylon, and those with a "cashmerized" finish.

"Gottschalk's" Stainless Steel Sponge, No. 725 (Metal Sponge Sales Corp., 3650 N. 10, Philadelphia 40) 25c.

Master Lint Brush (Distributed by Industries for the Blind, N.Y.C.) $1. Same comments as *Golden Wand*.

Minute Mop by Ekco, No. M-45 (Ekco Products Co., 1949 N. Cicero Ave., Chicago 39) Sponge replacement head, $2.50, to be used with self-wringing holder, *Hydro-matic 400* ($3.98, complete). The sponge, made of duPont cellulose, was well designed to fit into corners and get close to walls.

Squeeze 'N Wash (Anchor Brush Co., Aurora, Ill.) $1, plus postage. Available from manufacturer and stores in A.M.C. group such as Strawbridge & Clothier, Philadelphia; Bloomingdale Bros., N.Y.C.; Bullock's, Los Angeles. Plastic bottle, fitted with a hollow brush top of nylon bristles that is easily removed for filling with liquid detergent. The device works very well, and minimizes direct contact of the detergent with the hands.

B. INTERMEDIATE

Jet Brush Dishwasher (I. J. Morritt Products Co., Chrysler Bldg., N.Y.C.) $2.98. Consists of a reservoir base with a long plastic tube, to be filled with liquid syndet which is released through a circular nylon bristled brush. Not as effective as *Squeeze 'N Wash*.

Speedee Wallpaper Cleaner (Distributed by Dover Products Co., 815 Arthington St., Chicago 7) $1. Sponge refills, 2 for 98c. Consists of a red rubber sponge attached to a short wooden handle by an enclosing wire rectangle. Did an acceptable job; handle too short for cleaning upper part of walls, and ceilings.

C. NOT RECOMMENDED

Electro Cleaner (Distributed by J. H. Smith Co., Inc., Greenfield, Mass.) $1.75. Claimed to remove lint and dust—like magic. Found to be less effective than a good bristle brush in removing lint and dust from clothing and upholstery.

Rubber Scrubber (Rubber Scrubber Corp., P.O. Box 122, Watertown, N.Y.) 15c. Scouring pads of sponge rubber, approximately 3 in. square, impregnated on one face with corundum, a harsh, sharp abrasive. Not as effective as steel wool for cleaning but convenient to use as the sponge rubber offers protection for the hands and fingernails.

HOUSEHOLD DRY-CLEANING SOLVENTS

Dry cleaning of garments is best left to the commercial dry cleaner. Use of a flammable (or even a non-flammable) solvent in or near a home by an untrained person can be extremely dangerous. Do not be misled by statements on the label of a dry-cleaning or spotting solvent even though, for example, the manufacturer claims his product *is safe, will not burn, and has no dangerous fumes*. Such statements, claiming all-around safety, are almost invariably incorrect.

Gasoline and *naphtha* catch fire easily, may often explode violently; even lifting a garment in and out of the solvent may produce a spark sufficient to cause an explosion.

Stoddard Solvent or *"safety solvent"* is not so dangerous as gasoline or naphtha but it is highly flammable and will ignite and burn furiously under certain conditions.

Non-flammable solvents, while they avoid the hazards of fire, must not be considered safe. Carbon tetrachloride should never be used for dry cleaning or spot removing, because it is highly poisonous. Trichloroethylene and perchloroethylene, also toxic, are less toxic than carbon tetrachloride and can be used occasionally, but with care, as spot removers, where ventilation is good (for example, on a porch, or patio).

CR recommends that, when a spot remover is purchased, the label be checked to be sure that the cleaner *does not* contain carbon tetrachloride.

▶ **REF:** BULLETIN, July '56.+++

Assembled spot-removing kits

CR does not recommend for household use assembled spot-removing kits which contain a variety of cleaning solvents, because the individual bottles are not labeled as to the nature of their contents or their toxicity. Besides, manufacturers sell these kits as a whole and do not provide the needed individual bottles to replace the liquids most frequently used.

MISCELLANEOUS CLEANERS

Analyses, but not ratings, follow for a number of cleaning mixtures. *Claimed uses* for the products are given in parentheses for the reader's convenience, but this is not to be construed as a recommendation by CR that the products are well suited for these purposes.

Bonnie Brite (Bonnie Brite Products Corp., N.Y.C.) 59c for 1 pt. (For windows, glass, and metalware.) Liquid. About 7% diatomaceous earth, 1% clay, ½% syndet, 18½% mineral spirits, 73% water. cr57

Boraxo (Pacific Coast Borax Co., N.Y.C.) 17c for 8 oz. (For hands.) Granular. About 29% soap, 70% sodium tetraborate, ½% sodium carbonate. cr54

Bruce (E. L. Bruce Co., Memphis 1, Tenn.) 89c for 1 pt. (For asphalt, ceramic, and rubber tiles, concrete floors, linoleum, and terrazzo.) Liquid. About ½% sodium carboxymethyl cellulose (CMC), less than ½% sodium chromate, 5% syndet, 94% water. cr57

Dazzle (J. L. Prescott Co., Passaic, N.J.) 17c for 1 qt. (For softening water, destroying odors.) About 3½% ammonia, ½% syndet, 96% water. cr55

Fuller (Fuller Brush Co., Hartford, Conn.) 77c for 1 pt. (For cleaning glass.) Liquid. About 31% isopropanol, 4% ammonia, 1% syndet, 64% water. cr58

Fulsol (Fuller Brush Co.) 89c for 16 oz. (For baked-on grease on pots, pans, stoves, grills, woodwork, and all hard surfaces.) Liquid. About 9% syndet, 3% sodium triphosphate, 1% thickening agent, less than 1% sodium chloride, 1% perfume, 85% water. cr56

Lestoil (Adell Chem. Co., Holyoke, Mass.) 37c for 1 pt. (For all-purpose cleaning and laundering.) Liquid. pH 11.2. About 41% pine oil, 8% soap, 2% trisodium phosphate, 49% water. cr57

Lumin Wash (Lumin Sales Corp., N.Y.C.) 45c for 1 pt. (For cleaning metal and painted surfaces, marble, tile, and leather.) Liquid. pH, 11.8. About 98½% water plus sodium sulfate, sodium metasilicate, and syndet. cr58

Lysol (Lehn & Fink Products Corp., Bloomfield, N.J.) 49c for 6 oz. (Disinfectant.) Liquid. About 25% soap, 20% mixed cresols, 5% isopropanol, 2% glycerol, 7% propylene glycol, 1% orthophenyl phenol, 40% water. cr56

New Dip-it (Economics Lab., Inc., St. Paul) 98c for 12 oz. (For removing coffee stains from coffee makers and plastic ware.) Powder. pH of 1% solution, 11.4. About 37% sodium metaborate, 36% trisodium phosphate, 21% sodium silicate, 6% syndet. cr58

Oakite (Oakite Products, Inc., 19 Rector, New York 6) 14c for 10 oz. (For general cleaning.) Powder. About 39% sodium bicarbonate, 8% sodium carbonate, 31% trisodium orthophosphate, 2% syndet, 20% water of crystallization. cr54

Randu (Kusiel Chem. Co., N.Y.C.) $8.75 for 5 gal. (For walls, woodwork, various flooring materials.) Liquid. About 4% soap, 5% trisodium phosphate, 6% pine oil, 85% water. cr56

Reen'o (Reen'o Sales Corp., St. Louis 9) 59c for 6 oz. (For cleaning and removing stains from coffee pots, teapots, chinaware, and melamine plastic.) Powder. About 17% sodium metasilicate, 12% tetrasodium pyrophosphate, 22% sodium sesquicarbonate, 30% sodium perborate, 6% sodium sulfate, 9% sodium chloride, 4% syndet. cr58

Rust-Go (Clark's Ideal Products, Inc., Waterville, N.Y.) 49c for 2 oz. (For removing rust from chrome.) Paste. About 8% soap, 12% ground feldspar (abrasive), and 80% water. cr56

Shining Armor (Endurance Prod. Co., N.Y.C.) 44c for 10 oz. (For cleaning glass.) Liquid. About 13% isopropanol, 1% syndet, 86% water. cr58

Twinkle (The Drackett Co., Cincinnati) 43c for 4⅜ oz. (For cleaning coffeepots and pans.) Paste. About 8% hydrochloric acid, 23% sodium sulfate, 31% crystalline silica, 23% syndet, 15% water. cr58

Vision Kleen (Abbott-Lane Co., Merrick, N. Y.) $1.50 for 250 tablets. (For cleaning glass and plastic.) About 60% sodium bicarbonate, 19% sodium dihydrogen phosphate, 5% sodium acid sulfate, 3% sodium chloride, 5% syndet, 8% moisture. cr58

Williams (Newman Products Co., N.Y.C.) $1 for 4 oz. (For general cleaning.) Powder. About 24% tetrasodium pyrophosphate, 36% sodium sesquicarbonate, 7% sodium sulfate, 3% sodium silicate, 14% syndet, 16% moisture. cr57

Zip-O (Pitman Labs., East Pitman, N.J.) $1 for 4 oz. (For general use.) Strongly alkaline powder. pH of 1% solution, 12. About 39% trisodium phosphate, 16% sodium sulfate, 15% syndet, 8% sodium carbonate, 2% sodium chloride, 20% water. cr55

U. OF I
LIBRARY

Electric housewares

Electric skillets • waffle irons and sandwich grills

blenders • mixers • toasters • coffee makers • lamp bulbs

ADVERTISING for some small electric appliances, known in the trade as electric housewares, has been outstanding for misrepresentation in the past year or two. In nearly all cases the consumer may simply disregard the so-called list price when the advertised price is very low by comparison. The market value of an appliance is measured by the price it sells at, not by some mythical price it is supposed to have been "made to sell at," as claimed in advertising, or marked on the carton.

The claim of $39.95 value (or any other figure far above the actual selling price) for an appliance offered at $8.95 is absurd on its face, and consumers should simply avoid as probably highly inferior, if not actually electrically dangerous, appliances which are offered on any such basis of advertising claims.

Another common practice which should be a cause for suspicion of an appliance is the misuse of well-known trade marks or brand names in association with brands of appliances of unknown or little-known names. For example, the use in advertising of General Electric and Westinghouse names may indicate only that the thermostat or cord, or some other component, is made by one of these famous companies. The *UL* seal sometimes featured may apply only to the cord and not to the appliance. Where such techniques are used in advertising or selling, it is safest to assume that the appliance itself is a gyp product of low value and very possibly electrically unsafe.

ELECTRIC SKILLETS

Their automatic temperature control is a convenience for any cook.

The electric skillet has reached an extraordinary degree of popularity in a very short time. Over six million skillets with a value of $100,000,000 were marketed in about three years.

A skillet's value with the housewife is due to the dependability of its temperature control as compared with the use of a frying pan on the usual gas or electric range burner. The controlled heat greatly reduces the tendency of foods to burn or stick to the pan and assures that today's fried eggs or omelet will be like yesterday's. Skillets of good makes are regularly to be found heavily price-cut in the discount houses, but be specially wary of any unknown make or any that lacks the *UL* label *on the skillet itself* (label on wire or plug is not enough!).

One of the newer developments in electric skillets is the use of separate plug-in thermostatic controls. With the removable thermostat unit, the pan can be completely immersed for cleaning with no danger of ruining the control elements by the entrance of water or detergent. Of the pans tested, the *Presto, Farberware, Universal 8230,* and *Wonderfry Model 77* had removable thermostats. These control units are not interchangeable among different brands but can be used on other electric cookware made by the same manufacturer. CR found that the removable control units did not give desired temperatures as accurately as the best of the built-in thermostats.

In each case the table top under the skillets did not become hot enough that the varnished surface was damaged by the heat. The skillets passed CR's tests for electrical safety, except as noted. In a few cases, plastic handles and other parts of the appliances became too hot to be touched; such are noted in the listings.

Prices given are list prices, unless otherwise stated, but all the skillets were available at reduced prices in department and discount stores.

Ratings are cr57.

A. RECOMMENDED

Farberware, Model 280 (S. W. Farber, Inc., New York 54) $14.95 for frypan, $7.50 for separate control, $3.25 for cover. Capacity, 3 qt. *UL* label on pan and on control. Cooked (and fried) foods satisfactorily. Small plastic handle opposite main handle became too hot to touch when pan was operated at a high temperature for 30 minutes.

Hamilton Beach, Model 11F (Hamilton Beach Co., Div. of Scovill, Racine, Wis.) $22.95 for frypan, $3 for aluminum cover, $3.50 for copper cover. Capacity, 4 qt. *UL* label on pan and cord. Cooked foods satisfactorily, but eggs stuck to pan. Plastic handle and metal collar at base of handle became too hot to touch when pan was operated at high temperatures.

Kenmore (Sears-Roebuck's Cat. No. 34—6953, 6954) $11.88 for frypan, $2.50 for metal cover, plus shipping charges. Capacity, 4 qt. *UL* label on pan and cord. Cooked foods somewhat unevenly. Pan was fairly easy to clean.

Presto, Model SS-32A (National Presto Industries, Inc., Eau Claire, Wis.) $12.95 for frypan, $3.25 for metal cover, $6.95 for separate control. Capacity, 2½ qt. *UL* label on pan and on control. Cooked foods satisfactorily.

Quaker, Model 105 (Quaker Industries, Inc., Silver Creek, N. Y.) $10.95 including metal cover. Capacity, 3 qt. Manufacturer's name was not on pan or in instruction book as it should be. *UL* label on pan and on cord. Cooked foods satisfactorily.

Sunbeam FP-10 (Sunbeam Corp., Chicago 50) $19.95 for frypan, $3 for cover. Capacity, 2¼ qt. *UL* label on pan and on cord. Cooked foods satisfactorily.

Toastmaster, Model 8A1 (Toastmaster Products Div., McGraw Electric Co., Elgin, Ill.) $19.95 for frypan, $3.25 for metal cover. Capacity, 2½ qt. *UL* label on pan and on cord. Cooked foods satisfactorily.

Westinghouse, Cat. No. EFP 551 (Westinghouse Corp., Mansfield, Ohio) $22.95 for frypan, plus $4 for "copper-tone" cover. Capacity, 3 qt. *UL* label. Cooked foods satisfactorily.

B. INTERMEDIATE

Universal 8230 (Landers, Frary & Clark, New Britain, Conn.) $16.95 for frypan and aluminum cover, $6.95 for separate control No. 8250. Capacity, 2¾ qt. Glass lid. Thermostat control handle became very hot (150°) when pan was operated at high temperature. Screw holding handle to skillet protruded and was sufficiently hot to cause a bad burn when picking up skillet. *UL* label on pan and on cord. Cooked foods fairly well (some sticking).

Wards DE-2132-A (Montgomery Ward's Cat. No. 86—2132M, 86—2116) $14.49 for frypan plus $2.29 for aluminum cover, plus postage. Capacity, 3¼ qt. *UL* label on pan and cord. Cooked foods somewhat unevenly. One of the test samples failed proof-voltage test.

C. NOT RECOMMENDED

Dormeyer Fri-Way, Model 9300 (Dormeyer Corp., Chicago 10) $21.95, including copper-toned cover. Capacity, 3½ qt. Thermostat was unreliable (light went off much before desired temperature was reached). No *UL* label or listing. Cooked foods satisfactorily, but there was slight sticking. Temperature distribution in pan was uneven. Plastic handle became too hot to touch when pan was operated at high temperature setting. Appreciable leakage current, with some shock hazard under humid conditions.

Fryall, Model F-4A (DuWal Inc., River Grove, Ill.) $10 including cover. Capacity, 3¼ qt. *UL* label on pan and cord. Shock hazard due to lack of guard at the terminal pins that receive the line cord connectors. The appliance had an inherent shock hazard besides (leakage current over 5 ma.).

General Electric 15C26 (General Electric Co., Bridgeport, Conn.) $18.95 for frypan plus $3 for metal cover. Capacity, 3 qt. *Model C120* is similar except it has colored outside surface. *UL* label on pan and on cord. Two samples of this pan exhibited excessive leakage current.

Universal 8212 (B-8210 frying pan, 8211 cover) (Landers, Frary & Clark) $22.95 including cover. Capacity, 2½ qt. *UL* label on pan and on cord. Excessive shock hazard (5 milliamperes leakage as received). The *Model 8212* is no longer in production, but some may still be available in stores.

Wonderfry 77 (Merit Enterprises, Inc., Brooklyn 8, N. Y.) $19.95 "list," purchased for $8.90 at discount house. Capacity, 3¼ qt. Listed by *UL*, but no *UL* label appeared on the pan. Excessive shock hazard on sample tested (over 5 ma. leakage).

Wonderfry 4200 (Merit Enterprises, Inc.) $8.95 including postage from Niresk Industries, Chicago 47 (alleged list price $39.95). Capacity, 4 qt. Listed by *UL*. Shock hazard due to lack of guard at the terminal pins that receive the line cord connector. Due to poor welds the handle broke off the pan early in testing. Over-all construction was judged to be poor.

▶ **REF:** Bulletin, Dec. '57.+++

COMBINATION WAFFLE IRONS AND SANDWICH GRILLS

With storage space at a premium in almost every home, the combination waffle iron and sandwich grill is a good choice for many families. Usually the change-over from one appliance to another is accomplished either by changing the grids or by turning the grid surfaces over. The first method, used by most manufacturers, has one disadvantage, the necessity for storing the separate grids of the grill or waffle iron.

A control to regulate the temperature was to be found on each of the combination waffle iron-grill appliances tested.

Temperatures beneath the appliances tested did not in any case reach 175°F (which would damage most table-top finishes) after operation at highest temperature setting for half an hour.

On all of the appliances tested, the handles could become sufficiently hot after operation over a long period of time to present a hazard of burning the fingers. For short-period operation, only the *Universal's* handle became too hot to touch. It is important that the appliance be stable when the top is lifted for adding waffle batter, for example, and all of those tested were relatively good in that respect. Bottom and top portions should be level when they are opened out for use as grills. Since the grids may be level on some samples and not on others, the consumer should check in the store the particular model he picks out. Five brands, *Dominion, Presto, Sunbeam, Superlectric,* and *Westinghouse,* had a cup or dish for catching the grease overflow.

On waffle irons, an overflow groove or rim is almost a necessity, for few housewives can be counted on to use just the right amount of batter for each waffle. Most manufacturers provide a groove or rim as part of the waffle grid but on some, *Superlectric* and *Toastmaster,* for example, there is no overflow groove and the rim is raised so slightly as to be of little value.

Most of the combinations tested were square in shape, about 13 inches by 13 inches. The *General Electric* and *Superlectric* were rectangular, about 8 inches by 12 inches. The *Presto* grill was rectangular also, about 9 inches by 20 inches. All combination sandwich grill-waffle irons tested were for alternating-current operation only.

All the waffle-iron-sandwich grills except the *Superlectric* had the *UL* label.

Ratings are cr57.

A. RECOMMENDED

Dominion 1225 (Dominion Electric Corp., Mansfield, Ohio) $21.95. Square. Had four grids: two for waffles, two for the sandwich grill. A good serviceable appliance that performed well in all tests.

Toastmaster 2D3 (Toastmaster Products Div., McGraw Electric Co., Elgin, Ill.) $32.50. Square. Had four grids: two for waffles, two for sandwich grill. The *Toastmaster* made good, evenly-browned waffles.

Wards (Montgomery Ward's Cat. No. 86—2110) $17.95, plus shipping charges. Square. Had two reversible grids. A good, serviceable appliance that performed satisfactorily in all tests. Design of handle (which lifts to form foot for grill) presents a burn hazard.

Westinghouse SG WB 521 (Westinghouse Electric Corp., Mansfield, Ohio) $32.95. Square. Had four grids: two for waffles, two for grill. The *Westinghouse* made good, evenly-browned waffles.

B. INTERMEDIATE

Presto Griddle SG-33 (National Presto Industries, Inc., Eau Claire, Wis.) $14.95. Rectangular. Some shock hazard present in griddle tested under conditions of high humidity. ¶Separate *Control Master HC-1* ($6.95) would receive an *A-Recommended* rating.

Sunbeam CG (Sunbeam Corp., 5600 Roosevelt Road, Chicago 50) $34.95. Square. Had four grids: two for waffles, two for grill. Would have received an *A-Recommended* rating except that there was some shock hazard present under high humidity conditions.

* * *

General Electric G42 (General Electric Co., Bridgeport, Conn.) $21.95. Rectangular. Had two reversible grids. This appliance baked and grilled unevenly.

C. NOT RECOMMENDED

Kenmore (Sears-Roebuck's Cat. No. 344—6668) $18.95, plus shipping charges. Square. Had two removable waffle grids: grill surfaces were part of the appliance. Appliance performed well in baking and grilling tests, but there were some disadvantageous features, and an excessive degree of shock hazard was present on one of two samples tested.

Superlectric 116A (Superior Electric Products Corp., Cape Girardeau, Mo.) $12.95. Oblong. Excessive shock hazard on two samples tested.

Universal 3805 (Landers, Frary & Clark, New Britain, Conn.) $29.95. Square. Had four grids: two for waffles, two for grill. The grill of this combination appliance performed satisfactorily, but the waffles stuck to the waffle grids from the beginning and thereafter. Some shock hazard under high humidity conditions.

▶ **REF:** Bulletin, Oct. '57.+++

ELECTRIC BLENDERS

A blender works best when there is a small amount of liquid in the container, although once the technique for dry mixing has been mastered, a blender is very useful for crumbing graham crackers for pie, for example, or crackers for casserole dishes. Some tasks a blender will not perform well. Egg meringue, whipped cream, mashed potatoes, and heavy batters will be whipped better with a regular electric mixer. The blender will not chop any substantial quantity of meat satisfactorily.

Some blenders have the blades built into the bottom of the container. On others, the blade is part of a separate assembly which is removable for cleaning. The advantage of the second method is slight, however, as all that is usually required for cleaning is to put water with some detergent added into the jar and turn the blender on for a few seconds.

The two-piece cover used on some blenders makes it possible to add ingredients while the blender is running. Another convenience found on some is quantity markings on the container. Only five of the blenders tested could be filled close to capacity with liquids without danger of spillage. These were the *Handyhot Blendette, Kenmore, Osterizer, Universal,* and *Sunbeam Blender Attachment.* The listings give the maximum liquid capacity without spilling over when the blender is used on high speed with water or other "thin" liquid.

The blender attachment for the *Sunbeam* food mixer was found less satisfactory than the regular blenders, probably because of its low maximum speed.

Blenders present certain hazards. Never push food material down against the blades with the fingers. When using a spatula to move food materials, shut off the appliance. Young children should never be permitted to operate a blender.

Ratings are cr57.

A. RECOMMENDED

Hamilton Beach Liqui-Blender, No. 5 (Hamilton Beach Co., Div. of Scovill Mfg. Co., Racine, Wis.) $39.50. Two-speed motor; high speed, 22,000 rpm. Switch markings were not easy to read. Maximum capacity without spilling, 12 oz. A standard screw-top fruit jar of any size will fit in place of the regular container. Blade unit was removable for cleaning. ¶New model, *No. 6,* at $39.95 appears similar. 3

Osterizer Deluxe, Model 403 (John Oster Mfg. Co., Milwaukee) $49.95 with chrome base ($44.95 with white enameled base). Two-speed motor; high speed, 17,750 rpm. Switch of good type, well marked. Maximum capacity without spilling, 32 oz. Screw-top fruit jar will fit in place of the regular container. Blade unit was removable for cleaning. 3

Universal Mixablend, Model B6405 (Landers, Frary & Clark, New Britain, Conn.) $47.95. Two-speed motor; high speed, 12,800 rpm. Switch of good type, well marked. Chrome base. Maximum capacity without spilling, 28 oz. Blade unit was fixed in container. 3

Waring Blendor, Model 702 (Manufactured for Waring Products Corp., New York 36, by Winsted Hardware Mfg. Co., Winsted, Conn.) $44.95. Two-speed motor; high speed, 19,900 rpm. Switch was not marked for "Off" position. Chrome base. Maximum capacity without spilling, 8 oz. Blade unit was fixed in container. 3

B. INTERMEDIATE

Eskimo Whiz-Mix, Model 517 (Bersted Mfg. Div., McGraw Electric Co., Boonville, Mo.) $24.95. Two-speed motor; high speed, 15,500 rpm. Switch well marked. Chrome base. Maximum capacity without spilling, 12 oz. Blade unit was fixed in container. The *Eskimo* had suction cups on the bottom which held the blender firmly to the counter top. One sample failed test for electrical safety. 1

Montgomery Ward 86—2051 (Montgomery Ward's Cat. No. 86—2051M) $24.95, plus postage. One-speed motor; 17,000 rpm. Toggle switch, not well marked. Chrome base. Maximum capacity without spilling, 7 oz. Container fitted very loosely and could easily be knocked over. Blade unit was fixed in container. One sample of two tested failed test for electrical safety. 1

Dormeyer, Model 5902 (Dormeyer Corp., Chicago 10) $29.95. One-speed motor; 16,700 rpm. Toggle switch (metal), not well marked. White enameled base. Maximum capacity without spilling, 7 oz. Container fitted very loosely and could easily be knocked over. Blade unit was fixed in the container. One sample of two tested failed test for electrical safety. 2

Kenmore, Model 8262 (Sears-Roebuck's Cat. No. 34—8262) $24.95, plus postage. Two-speed motor; high speed, 18,000 rpm. Switch well marked. White enameled base. Maximum capacity without spilling, 24 oz. Blade unit was fixed in the container. One sample of two tested failed test for electrical safety. 2

C. NOT RECOMMENDED

Handyhot Blendette, No. 2001 (Chicago Electric Div., The Silex Co., Chicago 38) $18.95. One-speed motor; 3700 rpm. Too slow for good blending. Had a push-button switch (metal) of unsuitable design. 1

Knapp-Monarch Liquidizer, No. 40-505 (Knapp-Monarch Co., St. Louis 16) $39.95. Three-speed motor; high speed, 17,800 rpm. Switch of good type, well marked. White enameled base. Maximum capacity without spilling, 8 oz. Liquid that spilled over ran into the motor, giving high shock hazard (leakage current). Blade unit was fixed in container. ¶New model, *40-504,* at $35 not tested. 3

* * *

The following appliance, although fairly satisfactory, was judged to be not so convenient and effective for use as a regular blender.

Sunbeam Blender Attachment for Models 10 and 11 Sunbeam Mixmaster (Sunbeam Corp., Chicago 50) $12.95. Ten speeds; high speed, 6000 rpm. Maximum capacity without spilling, 32 oz.

▶ **REF:** BULLETIN, Dec. '56.+++

ELECTRIC FOOD MIXERS

The food mixer is a convenient tool in almost any kitchen. More than half of the mechanical operations in a typical kitchen are jobs like mixing, whipping, beating, stirring, creaming, and kneading — tasks that the mixer can do handily. A stand-mounted mixer, which may cost $10 to $40 more than a portable one, will have a more powerful motor and be better suited to some mixing jobs.

If adequate storage space is available (preferably on the counter top, where the mixer will be handy to use), the best choice will be a stand-mounted mixer with a head that can be detached and used as a portable mixer when desired. All the stand-mounted mixers tested except the *KitchenAid* could be used in this way. However, the power heads weighed from 3¼ to 6½ pounds, compared to 1½ to 3½ pounds for portable mixers tested by CR.

Speed controls should be easily accessible to either hand, and should be so designed, with a lock or notch at the off position, that they cannot possibly be turned on accidentally. The mixer is one of the most dangerous of household appliances to housewives and children; many serious accidents (finger amputations, etc.) have been caused by mixers being started unintentionally. A mixer that is not in use should never be left plugged into the wall outlet.

Stand-mounted mixers

Accessories were not evaluated, because their use in the average home is likely to be limited. Many attachments are available, however, such as juicers, meat grinders, coffee grinders, pea shellers, and even such non-cooking items as sanders, buffers, and paint stirrers. It is generally not advisable to use a mixer for such heavy-duty tasks as sanding and buffing.

None of the mixers tested failed in the laboratory life test. Bits of metal from the spindle sleeve and the ejector assembly of the *Sunbeam*, however, were deposited in the bowl during this test, due to poor alignment of the ejector slide, a fault in assembly which might characterize some samples but not others. The *Dormeyer Power-Chef* and the *Westinghouse* both became noisy with use.

The two *General Electric* mixers, the *Hamilton Beach*, and the *Kenmore* were for alternating current only; the others were usable on either a.c. or d.c. Most of the mixers tested gave an amount of radio and television interference that was considered objectionable. All the mixers tested but one (the *Kenmore*) passed the usual tests for electrical safety. (But it is considered wise not to use any mixer on a metal counter top or close to a sink or to water faucets or water or drain pipes.)

A. RECOMMENDED

General Electric Triple-Whip, Model M12 (General Electric Co., Bridgeport 2, Conn.) $39.95, including juicer attachment. Mixer head weighed 5½ lb. Could be used with one, two, or three beaters. Twelve speed settings ranging from 490 to 970 rpm. Two bowls: 15½- and 8-cup capacity. Motor became hot during prolonged use.

General Electric All-Purpose, Model M15 (General Electric Co.) $27.95. Designed specifically for use as a portable as well as a stand-mounted mixer. Mixer head weighed 3¼ lb. Twelve speeds ranging from 400 to 930 rpm. One *Pyrex* bowl, 13¼-cup capacity. Sample tested was faulty, and its bowl had to be turned manually. ¶*Model M25* is essentially the same, but has two bowls and a different stand.

Hamilton Beach, Model HWT (Hamilton Beach Co., Div. of Scovil Mfg. Co., Racine, Wis.) $45.95. Mixer head weighed 5½ lb. Ten speeds ranging from 270 to 1000 rpm. Speed control had a notch at "off" position (desirable). Two *Pyrex* bowls: 12¾- and 5½-cup capacity. Timer (bell signal), considered a desirable convenience feature. ¶New model, *H*, at $45 appears similar.

KitchenAid, Model 3C (KitchenAid Electric Housewares Div., The Hobart Mfg. Co., Troy, Ohio) $69.50. Mixer head could not be removed from the stand for use as a portable mixer. One heart-shaped beater, no beater ejector. Some users judged it relatively difficult to insert and remove the beater. Ten speeds ranging from 220 to 960 rpm. at shaft, but beater had a planetary type of rotation. One *Pyrex* bowl: 12¼-cup capacity. The bowl was considered too deep for hand mixing ingredients easily at the bottom. Lacked the convenience and versatility of some other mixers. ¶Ice cream freezer attachment was rated *B. Intermediate* in study reported in July 1953 Bulletin.

Sunbeam Mixmaster, Model 11 (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $50.75, including juicer attachment. Mixer head weighed 5¾ lb. Ten speeds ranging from 270 to 870 rpm. Two bowls: 14¾- and 6¾-cup capacity. Has "Bowl-Shifter" lever which moves head into position for use with large or small bowl.

B. INTERMEDIATE

Dormeyer Mix-Maid, Model 7700 (Dormeyer Corp., Kingsbury and Huron Sts., Chicago 10) $29.95, including juicer attachment. Mixer head weighed 4½ lb. Nine speeds ranging from 640 to 910 rpm. Two bowls: 11¾- and 5-cup capacity; both relatively small. Results in mixing test were unsatisfactory compared with other mixers, since beaters did not reach the bottom or edges of bowl and because batter climbed up the sides of the bowl. In use tests, this mixer lacked power for mixing heavy cookie mixture. ¶New model, *9700*, at the same price appears similar.

Dormeyer Power-Chef, Model 4201 (Dormeyer Corp.) $47.50, including juicer attachment and meat grinder. Mixer head weighed 6¼ lb. (one of two heaviest tested). Ten speeds ranging from 440 to 1040 rpm. Two bowls: 11¾- and 5-cup capacity; both relatively small. Weights and measures scale on mixer head was considered a useful feature. Judged convenient to use as a stand-mounted mixer, but when used as a portable mixer, rough edges on the handle were uncomfortable.

Kenmore, Model 116.82700 (Sears-Roebuck's Cat. No. 34—08270) $32.95, plus postage. Mixer head weighed 5½ lb. Twelve speeds ranging from 260 to 980 rpm. Two bowls: 14¾- and 5½-cup capacity; cup graduations were marked on the small bowl (desirable). "Speed file" accessory had sharp edges and was judged inconvenient; moreover, it was hard to pull out. Leakage current, an indication of possible shock hazard, was slightly higher than desirable.

Universal, Model EA-B6226 (Landers, Frary & Clark, New Britain, Conn.) $47.50, including juicer attachment and food chopper. Mixer head weighed 6½ lb. (one of two heaviest). Ten speeds ranging from 440 to 1040 rpm. Two bowls: 11¾- and 5¾-cup capacity. Mixer head when tilted back and sideways was relatively unstable.

Westinghouse Food Crafter, No. FM-511 (Westinghouse Electric Corp., Springfield, Mass.) $49.95. Mixer head weighed 5½ lb. Lacked beater ejector. Six speeds ranging from 280 to 970 rpm. Two *Pyrex* bowls: 15- and 6½-cup capacity. Became hot and vibrated excessively in use test. Considered noisy in operation. ¶New model, *CM-571*, at $59.95 not tested.

▶ **REF:** Bulletin, July '56.+++

Portable mixers

Portable electric mixers are not as convenient or satisfactory in some uses as the larger mixers, but will serve well enough on most mixing jobs. They are much lower in price than stand-mounted mixers, and require much less storage space.

The portable mixers listed are usable on either a.c. or d.c., except the *General Electric*, which is for a.c. only.

A. RECOMMENDED

The following four mixers were judged most convenient of the portable mixers in kitchen use tests. Each has a heel rest, a handle, a speed control, and a beater ejector.

Dormey, Model 7500 (Dormeyer Corp., Chicago 41) $17.95. ¶New model, *9500,* at $19.95, claims 9 mixing speeds. 3

General Electric, No. M10 (General Electric Co., Bridgeport 10, Conn.) $17.95 (a.c. only). ¶New model, *M27,* at $19.95 not tested. 3

Sunbeam Mixmaster Junior, Model J (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $16.95. 3

Universal Mix-A-Beater, Model EA6230 (Landers, Frary & Clark, New Britain, Conn.) $18.95. 3

B. INTERMEDIATE

Waring Mixor, Model RM-1 (Waring Products Corp., 25 W. 43, New York 17) $19.95. ¶*Model RM-2* at $17.95 is similar. 3

▶ **REF:** Bulletin, Apr. '54.+++

ROTISSERIE BROILERS

Although the rotisserie broiler is a popular appliance, many of very poor quality have been made and sold. The list price of this appliance is very often fictitious and greatly padded; it is quite regularly sold at very large "discounts" from the so-called list price. This supposedly reduced price does not represent a saving but is merely the regular, normal competitive market price for the appliance.

The Federal Trade Commission has issued a complaint charging that the Roto-Broil Corporation of America has used fictitious pricing and other false advertising in newspapers, radio, and television.

CR tested two *Roto Broil '400' Riviera* and two *Broil-Quik Chef 55* rotisseries. All four were found to have dangerously high electrical leakage (see "Safety in the home," page 94). Cooking tests indicated that these appliances are far inferior to a regular kitchen range for most cooking. Moreover, a rotisserie usually draws current equal to the full capacity of a normal house branch wiring circuit, so that no other appliance may be used on the same line. Most of the outside of a rotisserie becomes hot enough in use to burn anyone who accidentally touches it. Even the switch on the *Broil-Quik* became too hot.

A rotisserie is difficult to clean and requires a large space for storage; people often find the appliance much less convenient and useful than they expected to. A rotisserie should not be used at the end of a long extension cord, and because of the extra hazard of electrical shock, the appliance should never be stored in a basement, or left exposed to dampness or the weather, or used outdoors.

Ratings are cr56.

C. NOT RECOMMENDED

Broil-Quik Chef 55, Mogul GTRB55 and Mammoth GTC55 (Peerless Corp., 615 W. 131, New York 27) $70, each, including *Bake-O-Matic* tray for baking. Rated at 120 volts, 11 amp. Actually used 13.6 amp. at 118 volts (about 1600 watts). One sample of each model had dangerously high electrical leakage (3 and 6.5 ma., respectively, many times a reasonable leakage current limit).

Roto-Broil '400' Riviera King Size, Model RB-RIV-K (Roto-Broil Corp. of America, Jay-Kay Metal Specialties Corp., 34-08 Northern Blvd., Long Island City 1, N.Y.) $60. Rated 120 volts, 1500 watts. Actually used 12.2 amp. at 118 volts (about 1420 watts). Two samples had dangerously high electrical leakage (3.2 and 5 ma., respectively).

▶ **REF:** Bulletin, Feb. '56.++

AUTOMATIC TOASTERS

A good toaster should give successive slices of uniformly-browned toast with consistent operation for many years. The mechanism should raise even a small slice high enough to permit its being picked up easily from a slot large enough to accommodate a range of sizes of bread slices. The control should suit a variety of tastes and various kinds of bread and be easily adjustable from light to dark. (But see page 134 regarding health hazard in eating burned toast.)

Speed of toasting is mentioned in the listings so that those with a preference may obtain a toaster that will give the sort of toast they prefer. Some prefer crunchy toast; this must be toasted slowly. Others like toast browned quickly, so that the inside is still soft and relatively moist. Homemade, whole wheat, thick, and very fresh bread toast more slowly, dry or stale bread more quickly.

Large heat-resistant handles on the toaster are desirable to protect the user from burns. Some parts of the shell of a toaster are likely to reach temperatures of about 200 degrees in use (much too hot to touch). Temperatures of the handles and controls, measured during toasting, were found satisfactorily low. The temperature of the table top beneath the hot toasters was found satisfactorily low in all cases. Always disconnect a toaster after use; never store one while it is hot; allow it to cool off first.

All toasters listed were for operation on a.c. only except the *General Electric T82* which was designed to work on either a.c. or d.c. All the toasters were listed by *UL.*

Rated watts input are followed in parentheses by the measured watts input whenever there was a significant difference. Each toaster handled two slices of toast at a time except the *Toastmaster 1C4,* which handled three.

None of the toasters tested was found satisfactory in all respects (particularly as to uniformity and consistency of toasting).

Ratings are cr55.

B. INTERMEDIATE

Kenmore (Sears-Roebuck's Cat. No. 34—6342) $13.95, plus postage. Watts input, 900. Toasting was of average uniformity over surfaces of slices. Degree of browning was fairly even from one pair of slices to the next at low, medium, and high settings. Speed of toasting, very slow. ¶New model, *34—6341,* at $14.50 appears similar. 1

Ward's (Montgomery Ward's Cat. No. 86—2297) $13.88, plus postage. Watts input, 1060. Toast could be lowered by operating a handle at either end of toaster (desirable). Uniformity, somewhat above average, but there was a tendency to toast one surface of the slice darker than the other. Browning, fairly even from one pair of slices to the next. Speed of toasting, fast. Sample marked *2297A* had high shock hazard (leakage current over 10 ma.), but second sample *(2297B)* was satisfactory. Did not have electrical design defect reported under *Knapp-Monarch 22-503.* 1

General Electric, Cat. No. T82 (General Electric Co., Bridgeport 2, Conn.) $18.95. Watts input, 1150 (1100). User's fingers were shielded from hot shell of toaster in moving the toast control. Uniformity, average. The degree of browning was fairly uniform for each pair of slices, with a tendency for later pairs to be lighter (at both light and medium settings). Speed of toasting, fast. 2

Universal Toastamagic, Model 2855 (Landers, Frary & Clark, New Britain, Conn.) $19.95. Watts input, 1050 (1070). Uniformity, average, but one side of each toast surface was slightly darker than the other. Degree of browning was fairly satisfactory, with a tendency for successive slices of toast to be darker (at all 3 settings). Speed of toasting, very fast. (A *Proctor 1478* toaster, now discontinued, is of similar design.) 2

Toastmaster, Model 1C4 (McGraw Electric Co., Elgin, Ill.) $34.95. 3-slice capacity. Watts input, 1380 (1350). The motor-operated "lower" and "raise" feature functioned satisfactorily. Uniformity, average, with tendency to dark areas, indicating "hot-spots" in heating element. Slight tendency for toast to darken with successive operations at medium setting. Speed of toasting, very slow. 3

Westinghouse, Cat. No. TO-5421 (Westinghouse Electric Corp., Mansfield, Ohio) $19.95. Watts input, 1320 (1420). Crumb receiver was somewhat difficult to open and close, but was easily cleaned. Controls and handles well designed to keep user's fingers from touching the hot metal shell of the toaster. Uniformity, slightly above average. Degree of browning was fairly consistent in succeeding pairs of slices at low and medium setting, with a tendency toward lighter toast in later slices at the dark setting. Speed of toasting, slow. During the operation test the timing mechanism several times failed to trip the carriage release. ¶New model, *TD-5422,* at $21.95 not tested. 3

C. NOT RECOMMENDED

Knapp-Monarch, Cat. No. 22-503 (Knapp-Monarch Co., St. Louis 16) $18.95. Watts input, 1060 (1030). Similar in many respects to *Ward's.* Failed final electrical tests following operation test. A direct short circuit to the casing occurred when the carriage handle was pushed down in regular use of the toaster. This reflects a fault of design which may cause some specimens of this model to become very dangerous to the user after a period of operation. 2

▶ **REF:** BULLETIN, Nov. '55.+++

The following toasters (tested and reported on in the April 1952 BULLETIN) are still current models.

A. RECOMMENDED

Toastmaster, Model 1B14 (McGraw Electric Co.) $18.95. For a-c or d-c operation. 2

Sunbeam, Model T-20 (Sunbeam Corp., Chicago) $28.50. For a-c operation only. 3

COFFEE MAKERS

Always measure the amount of water and ground coffee to insure good coffee brew, in any type of coffee maker. Also use water fresh from the cold-water tap. Do not use softened water. Since the flavor and aroma deteriorate on standing, coffee should be served immediately after brewing. Never boil the brew, and never re-use the grounds.

In order to get the desired strength of coffee, it is advisable to change the proportion of coffee to water rather than to vary the time or temperature of brewing (as is done in coffee makers that have "strength selector" dials). Marks for the measurement of water and coffee add to the convenience in use of a coffee maker, even if the marks are not necessarily accurate in terms of standard measure.

Coffee makers with a wide-diameter top opening are easier to fill and to wash. Clean coffee makers regularly with a suitable synthetic detergent to remove coffee oils, which otherwise become rancid. Select a coffee maker which has its electrical terminal prongs shielded, to guard against accidental finger contact when connecting the cord fitting, and keep electrical parts dry at all times.

Two vacuum-type and four percolator-type coffee makers are listed. While the vacuum type produces a less clear beverage, it has the advantage that it can brew a small amount of coffee as well as the full capacity. A small amount of coffee brewed in a percolator is rather weak and unpalatable.

Ratings are cr54.

A. RECOMMENDED

Mirro-matic, No. 9252M (Aluminum Goods Mfg.

Co., Manitowoc, Wis.) $13.95. Percolator type. Capacity, 4 to 8 cups. 600 watts. Brewing time (average), 13 min. Made dark-colored (strong) brew. ¶New model, *102-M*, at $12.95, appears similar. 1

Sunbeam "Coffeemaster," Model C30A (Sunbeam Corp., Chicago 50) $38.95. Vacuum type. Capacity, 1 to 8 cups. 1000 watts. Brewing time, 13 min. Made dark-colored (strong) brew. 3

B. INTERMEDIATE

Universal "Coffeematic," No. 4408 (Landers, Frary & Clark, New Britain, Conn.) $26.95. Percolator type. Capacity, 4 to 8 cups. 400 watts. Did not brew coffee at lowest temperature setting. Brewing time, 15 min. Made light-colored brew. ¶New model, *4458*, at $26.95, appears similar. 2

Knapp-Monarch, Cat. No. 51—501 (Knapp-Monarch Co., St. Louis) $37.50. Vacuum type. Capacity, 2 to 10 cups. 700 watts. Had an inconvenient cloth filter. Brewing time, 12 min. Made dark-colored (strong) brew. 3

▶ **REF:** Bulletin, July '54.+++

COFFEE EXTRACTOR

The *Filtron* is a device for preparing a liquid extract of coffee with cold water; the extract may be stored in the refrigerator for future use. The beverage is not comparable in flavor or aroma to freshly-made coffee made with a drip or vacuum coffee maker using freshly-ground freshly-roasted coffee.

One pound of coffee (regular grind) extracted with 5 pints of cold water yields about 40 ounces of extract, enough to make 40 5-ounce cups of coffee at the recommended strength.

B. INTERMEDIATE

Filtron (Helmco, Inc., 7400 W. Lawrence Ave., Chicago 31) $19.50. Extraction time, about 12 hr. Must be cleaned carefully after each use. Was fairly bulky, measuring 13 in. high and 12 in. in diameter.

DEEP-FAT FRYERS

The lid of a fryer should be kept handy at all times, and used to cover the fryer immediately if the fat should start to burn. *A fryer should never be left unattended when plugged in.* The container may be washed after use, but the entire appliance should never be immersed in water. Special care is needed because of the great danger if hot fat should be spilled. Since fryers are often electrically hazardous, a good ground connection is considered an almost necessary safeguard. Always disconnect a fryer after use. It should be noted that, from a health standpoint, deep-fat frying is one of the least desirable methods of food preparation (see page 131).

ICE CREAM FREEZERS

On some modern ice cream freezers, the hand crank which turns the can around a stationary paddle has been replaced by a motor; otherwise the freezers are similar to the old-fashioned ones. Others, also motor-driven, eliminate the need for ice and salt by being used in the freezing compartment of a refrigerator.

Freezer for use in the refrigerator

B. INTERMEDIATE

Home Aid (The Silex Co., Philadelphia 33) $20. Capacity, 1½ qt. cr53 2

Tub ice cream freezers

B. INTERMEDIATE

Dolly Madison, Model 420-50 (J. E. Porter Corp., Ottawa, Ill.) $16.50. 2 qt. ¶Current model, *420-1*, sells for $29. cr51 2

Handyfreeze (Chicago Electric Div., Silex Co., Chicago 38) $20. 1 qt. cr51 2

Wards (Montgomery Ward's Cat. No. 86—1440M) $21.95, plus postage. 4 qt. cr51 2

KitchenAid 3B-CF (KitchenAid Div., Hobart Mfg. Co., Troy, Ohio) $16, plus postage. 2 qt. An accessory designed to be attached to the motor of *KitchenAid Mixer 3B*. Freezer accessories are also available for use with mixers *3A* and *3C*. cr53 3

PORTABLE ELECTRIC WATER-HEATING DEVICES

Some of the brands listed had a sealed element; others utilized the dangerous open-coil heating elements that come in direct contact with the water being heated (heating coil enclosed in a perforated case so that water is in direct contact with the element). All of the open-element heaters are hazardous, and have caused many deaths by electric shock. Even a sealed heating element can present a danger. The widely advertised and attractive *Liliput* immersion heater is such a device. This heater is used to boil a cup of water for tea or coffee or to heat a cup of soup. It is light and very portable. The manufacturer failed to make a watertight connection between the extension cord and the heating element enclosed in the plated, coiled metal tube. As a result, if the device was accidentally immersed, or rinsed off under a faucet, water easily entered the plastic plug-like housing enclosing the cord-element connection and presented a shock hazard almost as great as with the *Lux* and *Jiffy* devices.

Some of the brands listed are no longer manufactured, but may still be found in hardware stores or around the home in some cases. Many of the small water-heating devices advertised in popular magazines can present a very serious shock hazard; their sale, of course, should be prohibited by state and local authorities.

B. INTERMEDIATE

Flo-Hot Portable Electric Faucet Water Heater (Flo-Hot, Inc., 230 Grand St., New York 13) 1100 to 1200 watts. Less than 1 pt. per min. at 75°F temperature rise. Permanently grounded to water pipe (desirable for safety); electrical leakage (shock hazard), low.

Shokless (The Kneisly Electric Co., 490 St. Clair, Toledo 3, Ohio) Immersion type. About 1000 watts (desirably low), thus heating rate slightly less than *Flo-Hot.* Electrical leakage, low.

C. NOT RECOMMENDED

Jiffy Electric Heater (Electra, Inc., 809 W. Waveland Ave., Chicago 13) $1.25, plus postage. Immersion.

Kem (Kem Co., 18 E. 41 St., N.Y.C.) Faucet type. 1600 to 1750 watts. Heating element uninsulated, thus potentially dangerous.

Liliput Immersion Heater (Purchased from the United Cutlery and Hardware Products Co., 108 E. 16 St., New York 3) $2.98, postpaid. Also available from other dealers by mail order. Several similar heaters are sold under various brand names; all are characterized by red plastic plugs, white plastic-covered connecting cords, and red plastic "handles" from which the heating element extends. The element is a helically shaped metal tube, with a coil about 1 in. to 1¼ in. in diameter.

Lux Electric Water Heater (The Lux Co., Elkhart, Ind.) 1600 watts. Immersion type, with heating coil in direct contact with the water being heated, an inherently hazardous type of construction (great electrical shock hazard).

Roley (Roley Heater Co., 15 Spruce St., N.Y.C.) Faucet type. 2100 to 2500 watts; current drawn greatly beyond what is safe for usual house wiring. Serious shock hazard present.

Thermojet (Thermo Electric Corp. of America, 55 W. 42 St., N.Y.C.) Faucet type. 1500 watts. Leakage high but not dangerously so. The use of bare heater wires in contact with the water, and steaming of the unit when flow stopped were undesirable from a safety standpoint.

▶ **REF:** Bulletin, Apr. '49 ("Portable Electric Water Heaters"), Oct. '57 ("Immersion Water Heaters"). ● Additional references on home water heating: Mar. '53 ("Hot-Water Supply from Tankless Heaters"), Mar. '54 ("Choice of Water Piping for the Home"), Aug. '55 ("Gas-Fired Automatic Water Heaters—Part I"), Sept. '55 ("Gas-Fired Automatic Water Heaters—Part II"), Jan. '56 ("Water Heaters—Prolonging the Life of Tanks"), Oct. '56 ("Aluminum Hot-Water Tanks").

BREWMASTER ELECTRIC TEAPOT

This appliance, imported in very large numbers from Japan and sold widely, consists of a pale-buff-colored ceramic (earthenware) base of saucer-like shape, and a ceramic teapot with a lid.

Electric current is supplied to the heater by means of two metal spring-loaded pins in the base of the pot which make contact with two exposed metal electrodes on the saucer; the latter connect directly to the line cord. There is no switch; current is shut off by removing the pot or turning it on the base so that the contacts on the pot no longer touch those on the base.

The appliance is inherently unsafe, for even though the heating element is "off" with the pot removed, the saucer contacts remain electrically alive and at full line potential so long as the line cord is in the power outlet. There is still a further and very serious element of electrical hazard in the appliance, for with ordinary tap water being heated in the pot enough current flowed *from the water* to ground through a conducting object immersed in the water (a spoon, for example) to light a small (7-watt) electric lamp bulb. This current was *many times larger* than a safe current limit.

C. NOT RECOMMENDED

Electric BrewMaster (Made in Japan) $1.99 to $3.50. Marked OMSCO on bottom of pot. Electrically unsafe.

▶ **REF:** Bulletin, Mar. '58.+++

HEATING PADS

In using any heating pad, never use a pin of any kind to fasten it, never fold or crush, nor pull the cord to disconnect it. Do not operate the pad if it is wet or moist, and never apply to a helpless or sleeping person unless constantly attended. Any heating pad can become a dangerous hazard since it may cause burning of the skin, a fatal shock, or even set fire to the bedclothing. Examine the pad and waterproof covering every time it is used. If a defect is found or suspected, return the pad immediately to the manufacturer for repair. Always *disconnect* the pad after use. A heating pad should not be used when symptoms of appendicitis are present. Notices to the user included by some manufacturers with their heating pads state that the makers will assume no obligation or liability other than repairing or replacing defective pads.

Waterproof construction is preferable and, for sanitary reasons, a separate, removable, washable outer cover is desirable. Some pads, however, are sold as waterproof when they are not. They are distinguished by a warning label such as "Do not wet." Do not buy this kind of pad nor any heating pad that does not include a leaflet or attached tag of instructions and does not bear its maker's name and address.

All pads listed carried the *UL* label and were represented as waterproof. The model numbers listed have been superseded by later model numbers, but the later heating pads appear to be similar in most respects. Ratings are cr52.

B. INTERMEDIATE

Kenmore (Sears-Roebuck's No. 34—6969) $7.75, plus postage. Heat regulation, good. Not in current catalog. 2

Casco, Model H50-1 (Casco Products Corp., Bridgeport, Conn.) $8.45. Heat regulation, good. ¶New model, *H51,* at $8.95 appears similar. 3

General Electric, Cat. No. PS8A3 (General Electric Co., Bridgeport 2, Conn.) $8.95. Heat regulation, fair. ¶New model, *P18,* at same price not tested. 3

Glencoe, Model 100 (Glencoe Electric Co., Inc., N.Y.C.) $8.95. Heat regulation, good, but range very limited. 3

Westinghouse, Cat. No. WP-501 (Westinghouse Electric Corp., Mansfield, Ohio) $8.45. Heat regulation, good. Judged to be slightly better than others in group. ¶New model, *WP-571,* at $8.95 not tested. (*Walker* heating pad, Cat. No. 209—not tested—appears to be similar.) 3

▶ **REF:** Bulletin, Feb. '52.+++

ELECTRIC LAMP BULBS

Large-size bulbs produce *more light per watt,* and one should therefore use one large lamp of equivalent wattage rather than two or three smaller ones, where there is a choice. (One 60-watt bulb gives more *light* than three 25-watt bulbs totaling 75 watts of power consumption.)

Incandescent lamp bulbs can be made to have much longer life, but to do this the manufacturer must build them to give less light for a given amount of electricity used. The usual household lamp bulbs are designed for 750 or 1000 hours' average life span, as a calculated compromise between long life and high efficiency in use of electricity. The *Eternalite,* which is being widely advertised as "guaranteed to burn for 5 years," may very well do just that. The advertising doesn't mention that to overcome the handicap of low light output characteristic of this kind of lamp you may find it necessary to substitute a 100-watt long-life lamp for a 75-watt lamp of standard type. Compared to the long-life lamps, there is an economic advantage (considering costs for both lamp and electricity) of about 40 percent in favor of the standard inside-frosted home-use incandescent lamps. For example, standard 75-watt lamps will give about the same total amount of light during their life for only $4 as the long-life lamps give for from $5.35 to $5.90.

Consumers' Research tested a number of regular lamp bulbs and four bulbs sold with special claims, of which two claimed extra-long life. None of the four types of special 75-watt bulbs tested gave nearly as much illumination as an ordinary standard frosted 75-watt bulb. When only the light output at a given moment is considered, indeed, the special 75-watt lamps are more properly to be compared with ordinary bulbs of 60-watt rating. Prices include the federal excise tax.

40- and 60-watt, 120-volt inside-frosted general-lighting-service lamps

A. RECOMMENDED

Champion (Champion Lamp Works, Div. Consolidated Electric Lamp Co., Lynn, Mass.) 19c.

General Electric (General Electric Co., Nela Park, Cleveland 12) 19c.

Sylvania (Sylvania Electric Products, Inc., Salem, Mass.) 19c.

Westinghouse (Westinghouse Electric Corp., Bloomfield, N. J.) 19c.

75-watt, non-standard types

A. RECOMMENDED

General Electric Coloramic Pink (General Electric Co., Cleveland 12) 29c. 1000 hr. rated life. Amount of light furnished, 80%.

B. INTERMEDIATE

Eternalite (Eternalite Inc., 704 International Bldg., New Orleans 12) $1.05. Guaranteed 5 yr. Made in Switzerland. Amount of light furnished, 75% of the light furnished by standard frosted 75-watt bulbs over a 2000-hr. period. Advertising claim of 70% lower bulb costs is a misrepresentation.

Marvel 2000 Hours (Marvel Lamp Co., Hoboken, N.J.) 14c. Guaranteed for 2000 hr. Amount of light furnished, 65%.

Sylvania Softlight (Sylvania Electric Products Inc. Salem, Mass.) 29c. 1000 hr. rated life. Amount of light furnished, 70%.

▶ **REF:** Bulletin, Feb. '58.+++

Shaving and haircutting supplies

Electric shavers for men and women

safety razor blades • home haircutting kits

MEN'S ELECTRIC SHAVERS

According to surveys, about one out of every three shaving males now uses an electric shaver. Most of these men will agree that an electric shaver will not shave as closely as a good blade razor, but they do find that the shaver is more convenient to use and does the job faster.

The closeness of a shave and degree of skin irritation with an electric shaver will, in general, depend on the make of shaver, its condition, and the characteristics of the person's beard.

There are a few things one should look for before buying, besides effectiveness in shaving. These include checking for noise, cool running of the motor, expected life of head, and whether it is covered by a guarantee for this period. Best of all, before buying, use the shaver for at least a week on a trial basis with full refund guaranteed at the end of that time should the shaver prove unsatisfactory. It will also pay to get complete information on the frequency of servicing recommended by the manufacturer, and especially inform yourself in detail on what the service charges will be, as well as the price of replacement heads, cutters, and other parts.

Ratings are cr56.

A. RECOMMENDED

Ronson 66 (The Ronson Electric Shaver Corp., 59 Commerce Rd., Stamford, Conn.) $28.50 packaged in plastic case. $29.50 in leather zipper case. Weight, 10 oz. Operates on a.c. only. Synchronous vibratory drive-unit. Side clipper for long hairs.

* * *

The following four shavers (listed in alphabetical order) provided satisfactory shaves, but did not shave as closely as the *Ronson.*

Norelco (North American Philips Co., Inc., 100 E. 42, New York 17) $24.95. Weight, 10 oz. For a.c. or d.c. Well-made commutator-type motor. Capable of providing a good shave, but was relatively slow.

Remington 60 Deluxe (Remington Rand, Inc., Electric Shaver Div., Bridgeport 2, Conn.) $29.50. Weight, 12 oz. Contactor-type motor. A.c. or d.c. Ran noticeably warm after about 15 min. of use. Tendency to irritate skin of the face and particularly of the neck.

Schick 25 (Schick, Inc., Lancaster, Pa.) $29.50. Weight, 10 oz. Detachable electrical cord, 59 in. long (too short). Contactor-type motor. A.c. or d.c. Provided a good shave but was somewhat slow. There was bad radio interference. Ran warm.

Sunbeam Shavemaster (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $29.95. Weight, 12 oz. Detachable electrical cord, 59 in. long (too short). A.c. or d.c. Well-made commutator-type motor. Gave a good close shave but produced burning sensation at lip and on neck of some users and had a tendency to pull hairs when moving against the growth of the hair, unless the shaving was done slowly. There was considerable radio and television interference. This shaver was more difficult to clean than some of the others. Ran warm.

B. INTERMEDIATE

Craftsman 25 (Sears-Roebuck's Cat. No. 9—9283) $21, plus postage. Weight, 12 oz. Contactor-type motor. A.c. or d.c. Tendency to irritate the skin of the neck.

Schick 20 (Schick, Inc.) $26.50. Weight, 10 oz. Detachable electrical cord, 59 in. long (too short). Contactor-type motor. A.c. or d.c. There was bad radio interference.

C. NOT RECOMMENDED

Kobler (Made in Zurich, Switzerland; Kobler Shaver Co., Lynbrook, N.Y.) $39.75. Weight, 15 oz. Contactor-type motor. A.c. or d.c. Can be connected to any circuit between 110 and 220 volts merely by setting the voltage selector to 110, 150, or 220 volts. Provided a satisfactory shave, but was rather slow. There was radio and television interference. This shaver was considered hard to clean. Failed proof-voltage test, a more than ordinarily important fault in this instance, considering that the *Kobler* is intended for use on voltages as high as 150 and 220.

Remington Contour (Remington Rand, Inc.) $23.50. Weight, 12 oz. Contactor-type motor. A.c. or d.c. Tendency to irritate the skin of the neck. There was tho radio interference and a trace of television interference. Failed proof-voltage test.

Ru-Rita Fernbrook (Made in England; Quality British Corp., 120 Liberty, New York 6) $19.95. Weight, 11 oz. Contactor-type motor. A.c. or d.c. Has voltage selector to permit use on 110 or 220 volts as desired. Shave was only fair, but shaver caused considerable irritation of the skin of the face and particularly of the neck. There was radio and television interference. Considered hard to clean.

Schick Custom (Schick, Inc.) $28.75. Weight, 9 oz. (lightest of the shavers tested). Detachable electrical cord, 59 in. long (too short). Contactor-type motor. A.c. or d.c. Failed proof-voltage test. ¶See comments under *Schick 25.*

▶ **REF:** Bulletin, Jan. '56.++

WOMEN'S ELECTRIC SHAVERS

Not every woman will be fully satisfied with an electric shaver, but many women will find one easier on the skin and more convenient than a safety razor. Before selecting a make, it would be desirable to use it for a week or more on a trial basis, as suggested for men's shavers.

Ratings are cr56.

A. RECOMMENDED

Lady Norelco, Type 7767 (Made in Holland; North American Philips Co., Inc., 100 E. 42, New York 17) $24.95. For a.c. or d.c. Weight, 9 oz. plus 72-in. electrical cord. Commutator-type motor. Somewhat slower than other shavers but was most pleasant of all to use and was effective in removing long and short hairs on legs and under arms. 3

B. INTERMEDIATE

Lady Ronson, Model L (Made in Germany, Western Zone; The Ronson Electric Shaver Corp., 59 Commerce Rd., Stamford, Conn.) $14.95. For a.c. only. Weight, 7 oz. plus 71-in. cord. Synchronous vibratory drive-unit. Some of the teeth on the shaver head broke off during the use test. 2

Lady Sunbeam Shavemaster, Model LS-I (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $14.95. For a.c. only. Weight, 5 oz. plus 84-in. cord. Synchronous vibratory drive-unit. Lacked pocket for catching hair cuttings. Shaver had excessive vibration which was found objectionable. 2

Remington Duchess, Model 614 (Remington Rand, Inc., Electric Shaver Div., Bridgeport 2, Conn.) $21.50. A.c. or d.c. Weight, 10 oz. plus 61-in. cord. Contactor-type motor. The weight and bulk of this shaver and its spinning starting wheel were found disadvantageous. 3

C. NOT RECOMMENDED

Juliette, Model D (Purchased from a mail-order dealer in New York State) $3.95. For a.c. only. Weight, 8 oz. with permanently-attached 55-in. cord (short). Ran hot after 15 min. of use. Failed by large margin to meet requirements of proof-voltage test. ¶A number of small shavers similar to the *Juliette* are sold under a variety of names, at about the same price. 1

▶ **REF:** Bulletin, June '56.++

SPRING-POWERED SHAVER

For those who must travel to far places, or who like to hunt, and wish to be able to shave without electricity or water, there is a shaver powered by a spring, which is wound as one winds a clock.

A. RECOMMENDED

Thorens Riviera (Made in Switzerland; distributed by Thorens Co., New Hyde Park, N.Y.) $17.50. Weight, 17 oz. (most electric shavers weigh about 10-12 oz.). Equipped with two heads, one for cutting long hairs and one for close cutting of short hairs. Heads can be removed and attached easily and quickly. Gives a good shave, but much slower than a good electric shaver. A good shaver for commuters, campers, sportsmen, women, and others who wish to use a shaver where no electricity is available, and who do not wish to use a safety razor. Required rewinding for every 2½ min. of running. Would be too slow for daily shaving, for most men. 3

▶ **REF:** Bulletin, June '56.+

RAZOR

with means for honing and stropping

The *Rolls Razor* is a razor of special design with built-in honing and stropping mechanism; new owners will need to master the technique for its successful use. The blades supplied with some *Rolls* outfits were found inferior, and the owners lost time and money in securing replacements. Due to certain mechanical elements in the design, the blade pressure on the stropping device may be insufficient on some units. In selecting a *Rolls,* one may minimize the possibility of early failure by choosing one in which the pressed metal clip that activates the stropping motion hugs the brass roller uniformly over its entire length. Rating is cr52.

B. INTERMEDIATE

Rolls Razor, Imperial No. 2 (Made in England by Rolls Razor Ltd., London; distributed by Rolls Razor, Inc., 338 Madison Ave., N.Y.C.) $15. Safety razor with "built-in" honing and stropping mechanism. Weight complete, 1 lb. 1 oz.; razor 1¾ oz. All metal parts except the blade were nickel plated; blade must be wiped *thoroughly dry* after each use, far more carefully than one would wipe a safety-razor blade. Workmanship, very good. Shaving results varied among individuals. Considered just as fast as conventional safety razors after user had become familiar with the *Rolls.* 3

SAFETY RAZOR BLADES

A razor blade with sharp edges in a correctly designed holder is but one step leading to a good shave. Preparation of the face before shaving is also important.

The lasting quality of the edge can be enhanced by rinsing the blade after use, drying it carefully and completely, and then stropping it promptly.

CR tested a number of brands on a testing device designed to measure the degree of sharpness of each edge and to check the uniformity of the blades. (Shaving tests were conducted as a check on the findings.) Since blades sold by variety chain stores have in the past proved to be unusually variable, they have not been included in the present study. Prices given in parentheses are per blade; price ratings (1, 2, 3) are on per-edge basis. Ratings are cr58.

A. RECOMMENDED

Gillette type

Craftsman Blue Blades (Sears-Roebuck's Cat. No. 9—9304) (2.0c) 1

Craftsman Stainless (Sears-Roebuck's Cat. No. 9—9308) (4.0c) 1

Gillette Blue (Gillette Safety Razor Co., Boston) (4.9c) 1

Personna Precision (Personna Blade Co., Inc., New York 19) (4.9c) 1

Scotch "40 Day" (Urana Corp., Kenilworth, N.J.) (9.8c) 3

Other than Gillette type (single-edge and special blades)

Craftsman Chrome Single Edge (Sears-Roebuck's Cat. No. 9—9221) (2.0c) 1

Craftsman Stainless Single Edge (Sears-Roebuck's Cat. No. 9—9306) (4.0c) 1

Pal Hollow Ground Single-edge (American Safety Razor Corp., New York 17) (3.0c) 1

Pal Injector (American Safety Razor Corp.) (3.5c) 1

Schick Injector (Eversharp, Inc., Chicago) (3.7c) 1

Treet Single-edge (American Safety Razor Corp.) (3.0c) 1

Personna Precision Injector (Personna Blade Co., Inc.) (4.5c) 2

Gem Singledge (American Safety Razor Corp.) (5.9c) 3

B. INTERMEDIATE

Gillette type

Craftsman Thin (Sears-Roebuck's Cat. No. 9—9316) (2.0c) Uniformity and durability, only average. 1

Durex (Durex Blade Co., Inc., N.Y.C.) (2.0c) Durability, only average. 1

Gillette Thin (Gillette Safety Razor Co.) (3.8c) Uniformity, only average. 1

Marlin (Marlin Firearms Co., New Haven, Conn.) (2.5c) Uniformity, only average. 1

Silver Star (American Safety Razor Corp.) (4.9c) Uniformity, below average. 1

Other than Gillette type

Durham Duplex (Durham-Enders Razor Corp., Mystic, Conn.) (9.0c) Uniformity and durability, below average. 3

Enders (Durham-Enders Razor Corp.) (5.0c) Blades were below average in uniformity. 3

C. NOT RECOMMENDED

Gillette type

Pal Gold Thin (American Safety Razor Corp.) (2.5c) 1

Pal Hollow Ground (American Safety Razor Corp.) (3.0c) 1

▶ **REF:** Bulletin, June '58.++

Safety razor blade sharpeners

The life of safety razor blades can be effectively increased by the use of a good sharpener. Stropping, if done promptly after the blade is used, can greatly lengthen blade life. The keenness of some new blades may be improved by brief stropping before use, since razor blades are not uniform when they leave the factory.

Ratings are cr52.

A. RECOMMENDED

Twinplex, Model G200 (Twinplex Mfg. Co., Chicago 13) $2.50. **AA1**

Allegro, Model L (Made in Switzerland; distributed by a number of the larger cutlery stores) $6. Also available are *Model E* for single-edge blades; and *Model DD* for double-edge blades for razors other than *Gillette* and for single-edge blades. Hones and strops. **3**

B. INTERMEDIATE

Ingersoll (Durham-Enders Razor Corp., Mystic, Conn.) $2. 1

▶ **REF:** Bulletin, Nov. '52.++

SHAVING SOAPS AND CREAMS

Basically, whether one will use a shaving soap, shaving cream, or a brushless cream is a matter of personal preference. A brushless cream does not require a shaving brush, but the user may experience some disadvantages in its use, such as increased soiling of the shirt collar in summer, more difficulty in cleaning the razor and the washbowl, and the likelihood of more rapid dulling of razor blades. Brushless creams leave a thin coating of oil or grease on the skin which tends to protect the skin against chapping in cold weather. All cream preparations are considerably more expensive than the tablet or cake type of shaving soap which CR has reported for many years as the most economical in use.

Most important for obtaining good shaving results are proper preparation of the face, and the use of a sharp razor blade. Wash the skin thoroughly, using hot water, and rub the lather or cream into the skin. (Hot water is considered particularly important in softening the beard, according to one observer, who points out that repeated application of hot towels to the face by the expert barber is a factor in producing a closer shave.) Next, the face should be rinsed off with hot water and then shaving soap or cream applied again. About 3 minutes are needed for proper preparation of the beard. After these preparations, one may begin the actual shaving operation.

HOME HAIRCUTTING KITS

Some persons can learn to use hair clippers with skill; others may find the job difficult to master. Directions for use of clippers are of little assistance to the beginner; one must practice and learn a few tricks to be able to cut hair successfully.

It is well worth the time required to learn and to barber the heads of at least the male members of a family since, with even only one boy in the family, one can save the price of a kit in about six months' use.

Each of the hair clippers which passed CR's tests for electrical safety employed a vibrator to impart the desired oscillatory motion to the cutter head. Both samples of the *Oster Butch*, which had a motor with a rotating armature and might be expected to be preferable on that account, failed the high-voltage breakdown test.

The *Priests'*, *Raycine*, and *Oster* hair clippers included in the listings were supplied with No. 000 heads, which are designed to cut the hair very close to the skin if desired. Extra cutting heads No. 00, 0, and 1 may be purchased for most of the clippers; since they do not permit cutting the hair as close, they are not advised for home use.

The extension cords of all the clippers described in the following listings were of adequate lengths, switches were conveniently placed, and unless otherwise noted had well-identified on-off markings.

It is to be expected that any of the clippers will become rather too hot after extended use, and young children, in particular, will rightly complain if you touch their necks with the warm or hot metal. In the listings that follow, the list price is followed by the price CR actually paid for each kit in the open market just as a consumer would buy one.

Ratings are cr58.

A. RECOMMENDED

Priests' Hair Cutting Set, No. 100 (American Shearer Mfg. Co., Milwaukee 17) $10.95; $7. Practically the same as *Raycine* 5-piece kit.

Raycine 8 Piece Kit, No. 125 (Racine Clipper Co., Milwaukee) $16.95; $12. Rated watts, 12. Weight, 18 oz.

Raycine 5 Piece Kit, No. 104C (Racine Clipper Co.) $10.95; $7.75. Rated watts, 12.

Wahl Giant Multi-Cut Kit (Wahl Clipper Corp., Sterling, Ill.) $12.50; $10.75. Rated watts, 12. Weight, 19 oz. Good, neat design with good feel and balance. A lever at the side provided for easy adjustment of the closeness of cut from very close to almost ⅛ in., a desirable feature present only on the *Wahl Multi-Cut* clippers.

Wahl Multi-Cut Kit (Wahl Clipper Corp.) $11.95; $8. Rated watts, 12. Weight, 17 oz. Clipper was similar to *Wahl Giant Multi-Cut* in outward appearance and adjustments and the general comments in that listing apply.

Wahl Single-Cut Kit (Wahl Clipper Corp.) $10.65; $7.20. Rated watts, 12. Weight, 16 oz. Had the same outward appearance as the *Wahl Multi-Cut* and had the same vibrator motor; the *Wahl Single-Cut* did not have the lever adjustment for varying closeness of cut. Good, neat design with good "feel" and balance.

B. INTERMEDIATE

Supreme, Model S-217 K (Supreme Products Inc., Chicago 16) $10.95; $8. Rated watts, 14. Weight, 15 oz. Fit of two-piece plastic case was poor; would tend to collect hair cuttings (undesirable). An adjustable spring tesion was provided for the cutting blade. On-off positions of switch not marked. The clippers, when taken apart for cleaning, were not easily reassembled. No reinforcement was provided for the cord where this enters the case, but strain relief was adequate.

C. NOT RECOMMENDED

Oster Butch, Model 65 (John Oster Mfg. Co., Milwaukee 17) $17.95; $11.95. Clipper only. Two samples failed proof-voltage test.

▶ **REF:** Bulletin, May '58.++

Cameras, photographic equipment, and supplies

CAMERAS

No camera exists that will suit the needs of every amateur photographer or that can do everything equally well. There are many kinds of cameras available to suit the needs of all sorts of users; these range from the familiar box cameras to the very expensive and complicated 35 mm. cameras, or the larger cameras using sheet film or film packs with a variety of "tilts and swings" suited to the needs of the very advanced amateur or the professional.

The most popular types of cameras use either 35 mm. or No. 120 film. Both of these sizes are available as black and white and as positive or negative color film. There are signs that the No. 127 size may become popular if enough manufacturers bring out good cameras for this size. (For dimensions of pictures, see Table I on this page.) At the present moment, the best choice for 99 percent or so of camera users will be a 35 mm. camera or a camera using No. 120 film. Today's trend in using 35 mm. film is toward color slides. If black-and-white film is used, enlargements are essential; they are not expensive. (See Table I.)

Projectors are predominantly made for pictures taken with 35 mm. (miniature) cameras. We do not know of any projector fully satisfactory for 2¼ x 2¼ inch or 1⅝ x 2¼ inch slides made on No. 120 film. Adapters are available that take 1½ x 1½ inch slides, which can be projected satisfactorily in 35 mm. projectors.

Many enthusiastic amateurs now feel it is necessary to use two cameras, one for color and one for black-and-white pictures. A 35 mm. camera or miniature camera for color and a camera using No. 120 film for black and white is a practical and convenient combination. If you expect to take *many* colored pictures, the indicated size is 35 mm. If you expect to take many black-and-white pictures, one of the cameras taking pictures not smaller than 2¼ x 2¼ inch should be the choice. (2¼ x 3¼ is a very satisfactory size.)

Note: Prices given hereafter in this section are list prices. However, most cameras, photographic equipment, and supplies can be obtained in any big city at substantial discounts (say 25 to 35 percent) from these prices by shopping around. Most large camera stores claim they "will not be undersold."

Table I

Film size	Black and white; total cost per enlarged print* including negative film	Total cost per color slide mounted, including film		
		Kodachrome	Ektachrome Anscochrome	Super Anscochrome
35 mm.				
20 exp.	*10.25c*	*17.0c*	*17.0c*	*19.5c*
36 exp.	*9.25c*	*15.0c*	*NA*	*NA*
No. 120				
1½ x 1½, 12 exp.	*10.25c*	*NA*	*23c*	*27c*
1⅝ x 2¼, 16 exp.	*8.0c*	*NA*	*15.5c***	*19c***
2¼ x 2¼, 12 exp.	*10.25c*	*NA*	*23c*	*27c*
2¼ x 3¼, 8 exp.	*15.0c*	*NA*	*31c***	*38c***
No. 127				
1⅝ x 2¼, 12 exp.	*9.0c*	*NA*	*20c*	*NA*

NA—Not Available in this size and type.
* Based on prints approximately 3½ x 4½ inch.
** Not mounted.

SIMPLE CAMERAS

Simple box, folding, and imitation-reflex cameras are suitable for those interested only in obtaining satisfactory snapshots with the least amount of study and effort. The simple cameras usually have only two shutter speeds, instantaneous (about 1/25 second) and bulb. They require no focusing (or may have two- or three-zone focusing). For example, at one setting everything between 6 feet and 20 feet is in approximate focus and at the other setting everything between 20 feet and infinity is in focus. They have slow (*f*/8 to *f*/15) lenses which give good depth of focus and sharpness which many find reasonably satisfactory. With flash attachments, the simple cameras will give satisfactory snapshots indoors. Those that take 12 pictures on No. 127 film make color slides that will be satisfactory for the not too critical user. Imitation-reflex cameras are actually nothing more than box cameras fitted with big view-finders.

Box cameras

A. RECOMMENDED

Box Tengor (Carl Zeiss, Inc.) $10. 8 pictures 2¼" x 3¼" on No. 120 film. f/9 lens, 3 focusing zones. Made in West Germany.

Brownie Bull's-Eye (Eastman Kodak Co., Rochester, N.Y.) $13.50. Complete with flashgun, six No. 5 bulbs and 2 rolls of film, $20. 8 pictures 2¼" x 3¼" on No. 620 roll.

Brownie Starflash (Eastman Kodak Co.) $9; case, $3.50. Has built-in flash gun. 12 pictures 1⅝" x 1⅝" on No. 127 film. Color transparencies 1½" square. Double-exposure prevention.

B. INTERMEDIATE

Brownie Hawkeye (Eastman) $8; flash unit, $4 extra. 12 pictures 2¼" x 2¼" on No. 620 roll. f/15 lens.

Brownie Holiday (Eastman) $5. f/15 lens. 1⅝" x 2½" pictures on No. 127 film.

Readyflash (Ansco, Binghamton, N. Y.) $7; flash unit, $3. 2¼" x 3¼" pictures on No. 620 roll.

C. NOT RECOMMENDED

All cameras with single-element lens (meniscus, common on box cameras) that use 35 mm. perforated or *Bantam* film.

"Imitation reflex" cameras

All except *Brownie Starflex* take 12 pictures 2¼ x 2¼ inches on No. 620 film.

A. RECOMMENDED

Brownie Starflex (Eastman) $10.75; flash unit, $3.75; case, $3.55. 12 pictures 1⅝" x 1⅝" on No. 127 film. Double exposure prevention.

Duaflex IV (Eastman) $26.50, with f/8 *Kodar* lens in focusing mount; flash attachment, $4.50.

B. INTERMEDIATE

Anscoflex I (Ansco, Binghamton, N. Y.) $16; flash unit, $5; case, $3.50.

Anscoflex II (Ansco) $19; flash unit, $5; case, $3.50. Same as *Anscoflex I* except has built-in close-up lens and yellow filter.

Argus 75 (Argus Cameras, Inc., Ann Arbor, Mich.) $15; case, $3; flash unit, $4.25.

Duaflex IV (Eastman) $17, with *Kodet* lens.

MINIATURE CAMERAS

There are three chief types of miniature cameras:

(1) *Cameras without range-finders*, focused by setting the distance from the subject estimated in feet, on a scale.

(2) *Cameras with range-finders*, which are focused by adjusting the range-finder until two images (superimposed type) coincide or two halves of a single image (split-image type) line up.

(3) *The single-lens reflex*. Cameras in this third class, like the twin-lens reflexes, permit studying, composing, and focusing the scene on a ground glass (the same size as the negative) or through a prism which shows what the camera sees up to the moment the picture is actually taken. Single-lens reflex cameras, which in general are higher priced than regular 35 mm. cameras, have a strong attraction for many amateurs, but very often they do not turn out in practice to be nearly as useful as expected, except for the careful scientific worker, for medical, dental, and nature photography.

Some single-lens reflex cameras are now equipped with range-finders, to be used in focusing on the ground glass, which is difficult or impractical because of weakness of the light. The chief advantage of the single-lens reflex is the simplicity with which the lens can be changed to another for a particular purpose without calling for any change in the camera itself or any additional mechanism. A disadvantage is the shutter noise, often definitely disturbing.

Because the lenses of the miniature cameras are commonly set in a rigid mount and project far in front of the box part, the cameras are often too bulky to fit the pocket. A few cameras, such as the *Kodak Retina, Ansco Regent, Contina, Voigtlander Vitessa*, have a hinged front and bellows, and can be folded to small compass; this arrangement is fine for convenience and compactness but presents some difficulties in preserving the accurate setting and alignment of the lens that is necessary for small precision cameras.

For key to abbreviations of types of synchronization, see "Flash photography," page 75; other abbreviations: cpld., coupled; r-f, range-finder.

Low-priced 35 mm.

A. RECOMMENDED

Ansco Memar. $41.50; case, $7. *Agfa Apotar f/3.5* 45 mm. lens (satisfactory). *Pronto* shutter, 1/25-1/200 sec., bulb (B). X synchronization. Made in West Germany.

Edinex Midget Marvel. $29.95. *Edinar f/3.5* 50 mm. lens (satisfactory). *Vario*, 1/25, 1/75, 1/200 sec., B. X synch. Somewhat difficult to load. West Germany.

Minolta A. $49.95. *Rokkor f/3.5* 45 mm. lens (very good). *Optiper,* 1-1/300 sec., B. M-X synch. Coupled range-finder (cpld. r-f). A very good buy. Japan.

Vito B. $54.50. *Color Skopar f/3.5* 50 mm. lens (good). *Prontor SVS,* 1-1/300 sec., B. M-X synch. West Germany.

Vito IIa. $54.50. *Color Skopar f/3.5* 50 mm. lens (good). *Prontor SVS.* X synch. Front structure weak; must be used with care.

B. INTERMEDIATE

Classic 35. $19.95, with case and flash gun. *Meyer Trioplan f/2.9* 50 mm. lens (fair). *Vebur,* 1-1/250 sec., B. X synch. Germany (Soviet Zone).

Edixa C. $49.95. *Isconar f/2.8* 43 mm. lens (fair). *Pronto SVS,* 1/25-1/200 sec., B. X synch. Cpld. r-f. West Germany.

Paxette Ia. $36.95. *Steinheil Cassar f/2.8* 45 mm. lens (fair). *Vario,* 1/25-1/200 sec., B. X synch.

Ricoh 35. $59.95, with case and flash gun. *Ricomat f/3.5* 45 mm. lens (fair). *Riken,* 1/10-1/200 sec., B. X synch. Cpld. r-f. Japan.

Rival 35. $26. *Enna f/3.5* 50 mm. lens (fair). *Prontor S,* 1-1/300 sec., B. X synch.

C. NOT RECOMMENDED

Baldinette II. $49.95. *Schneider Radionar f/3.5* 50 mm. lens (poor). *Prontor SV.* M-X synch.

Bolsey B-2. $58.50. *Wollensak Anastigmat f/3.2* 44 mm. lens (fair). *Alphax,* 1/20-1/200 sec., time (T), and B. X synch. Cpld. r-f. Shutter inaccurate. Lens thrown out of focus by pressure on camera.

Bower 35. $43.50. *Steinheil Cassar f/2.8* 45 mm. lens (poor). *Prontor S.* X synch.

Bower 35. $47.50. *Steinheil Cassar f/2.8* 45 mm. lens (poor). *Prontor SV.* M-X synch.

Diaxette. $29.95, with case and flash gun. *Steinheil Cassar f/2.8* 45 mm. lens (poor). *Pronto,* 1/25-1/200 sec., B. X synch. Lens mount weak.

Iloca Quick A. $35. *Ilitar f/3.5* 45 mm. lens (poor). *Vero,* 1/25-1/200 sec., B. X synch. Awkward to use. Shutter speeds inaccurate. West Germany.

Kodak Pony 135B. $31.50. *Anaston f/4.5* 51 mm. lens (satisfactory). *Kodak Flash,* 1/25-1/200 sec., B. F synch. Body made of plastic (undesirable).

Kodak Pony 135C. $36.50. *Anaston f/3.5* 44 mm. lens (fairly good). *Kodak Flash 300,* 1/25-1/300 sec., B. F synch. Body made of plastic (undesirable).

Lordox. $29.50. *Wetzler Triplet f/2.8* 50 mm. lens (poor). *Prontor SVS,* 1-1/300 sec., B. M-X synch.

Spartus P-400. $14.95. *Achromat f/6.3* 50 mm. lens (poor). Rotary type, 1/50 sec., T. X synch. Body made of plastic (undesirable). Backs have warped.

Medium-priced 35 mm.

A. RECOMMENDED

Aires 35-111L. $99.50. *H-Coral f/1.9* 45 mm. lens (fairly good). *Seikosha,* 1-1/500 sec., B. M-F-X synch. Cpld. r-f.

Argus C-44. $117, with case and flash unit. *Cintagon f/2.8* 50 mm. lens (good). Behind-the-lens shutter, 1/10-1/300 sec., B. M-X synchronization. Cpld. r-f. Has provision for interchanging lenses.

Futura P. $98.75. *Futar f/3.5* 45 mm. lens (satisfactory). *Prontor SV,* 1-1/300 sec., T, B. M-X synch. Cpld. r-f. Well constructed but somewhat heavy.

Konica II. $89.75. *Hexanon f/2.8* 50 mm. lens (good). *Konirapid S,* 1-1/500 sec., T, B. F-M synch. Cpld. r-f. Japan.

Konica III. $119.75. *Hexanon f/2* 48 mm. lens (very good). *Konirapid,* 1-1/500 sec., B. M-F-X synch. Cpld. r-f. Japan.

Konica III MXL. $124.75; case, $12.50. *Hexanon f/2* 48 mm. lens (very good). *Seikosha-MXL,* 1-1/500 sec., B. M-F-X synch. Cpld. r-f. Japan.

Minolta A-2. $69.95; B-C flash gun, $8.50. *Chiyoko Rokkor f/2.8* 45 mm. lens (very good). *Optiper,* 1-1/400 sec., B. M-X synch. Cpld. r-f. Japan.

Vitessa N. $99.50. *Color Skopar f/3.5* 50 mm. lens (very good). *LVS Compur Rapid,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Not recommended with *Ultron f/2* lens. West Germany.

B. INTERMEDIATE

Ansco Super Regent. $89.50. *Agfa Solinar f/3.5* 50 mm. lens (fair). *Synchro Compur,* 1-1/500 sec., B. M-X synch. Cpld. r-f.

Argus C-3. $69.50. *Cintar Anastigmat f/3.5* 50 mm. lens (fair). 1/10-1/300 sec., B. X synch. Cpld. r-f.

Argus C-4. $99.50, with case and flash gun. *Cintar Anastigmat f/2.8* 50 mm. lens (fair). 1/10-1/300 sec., B. F-M synch. Cpld. r-f. Available with provision for interchanging lenses.

Graphic 35. $59.50. *Graflar f/3.5* 50 mm. lens (fair). *Prontor SVS,* 1-1/300 sec., B. M-X synch. Cpld. r-f. Well made.

Iloca Quick B. $79.50. *Schneider Ilitar f/2.9* 50 mm. lens (fair). *Prontor SV,* 1-1/300 sec., B. M-X synch. Cpld. r-f. Awkward to use. West Germany.

Lordomat. $89.50, with case. *Lordonar f/2.8* 50 mm. lens (fairly good). *Prontor SVS,* 1-1/300 sec., B. M-X synch. Cpld. r-f. Interchangeable lenses available.

Signet. $75. *Ektar f/3.5* 44 mm. lens (very good). *Synchro 300,* 1/25-1/300 sec., B. M synch. Cpld. r-f. Parts of shutter and gears for transporting film were weak.

C. NOT RECOMMENDED

Bolsey B-22. $69.50. *Wollensak Anastigmat f/3.2* 44 mm. lens (fair). *Alphax,* 1/10-1/200 sec., T, B. X synch. Cpld. r-f.

Higher-priced 35 mm.

The following cameras all had provision for interchangeable lenses, except as noted.

A. RECOMMENDED

Ansco Super Memar. $124.50; case, $9.75. *Solagon f/2* 50 mm. lens (very good). *Synchro Compur LVS* shutter, 1-1/500 sec., bulb. M-X synchronization. Cpld. r-f. Lens not interchangeable. Germany.

Canon IV S2. $284. *Canon Serenar f*/1.8 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. F-FP-M-X synch. Cpld. r-f. Japan.

Canon L-1. $259, with *Canon f*/2.8 50 mm. lens (very good); $440, with *f*/1.2 50 mm. lens (fair). Focal plane, 1-1/1000 sec., T, B. F-FP-M-X synch. Cpld. r-f. Japan.

Canon V. $325. *Canon f*/1.8 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. F-FP-M-X synch. Cpld. r-f. Japan.

Canon VT Deluxe. $277, with *f*/2.8 50 mm. lens; $458, with *f*/1.2 50 mm. lens. Similar to *L-1* except has self-timer and rapid-wind lever at the bottom instead of at the top of the camera. Japan.

Contax IIa. $298. *Zeiss Sonnar f*/2 50 mm. lens (good). Focal plane, 1-1/1250 sec., T, B. FP-M-X synch. Cpld. r-f. West Germany.

Contax IIIa. $328. *Zeiss Sonnar f*/2 50 mm. lens (good). Focal plane, 1-1/1250 sec., T, B. FP-M-X synch. Cpld. r-f. Same as *Contax IIa* except for addition of built-in exposure meter. West Germany.

Leica IIF. $178.50. *Elmar f*/3.5 50 mm. lens (variable). Focal plane, 1/25-1/1000 sec., B. FP-M-X synch. Cpld. r-f. Rated *B. Intermediate* with *Taylor-Hobson Cooke f*/2 lens. West Germany.

Leica IIIF. $336. *Summicron f*/2 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. FP-M-X synch. Cpld. r-f. Rated *B. Intermediate* with *Taylor-Hobson Cooke f*/2 lens. West Germany.

Leica M-3. $456. *Summicron f*/2 50 mm. lens (good). Focal plane, 1-1/1000 sec., B. FP-M-X synch. Cpld. r-f. One of the finest-engineered cameras available. West Germany.

Nikon SP. $415. *Nikkor S-C f*/1.4 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. F-FP-X synch. Cpld. r-f. Japan.

Nikon S-2. $299.50. *Nikkor H-C f*/2 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. FP-M-F-X synch. Cpld. r-f. Excellent value. Japan.

Tower 35. $169.50. *Nikkor H-C f*/2 50 mm. lens (good). Focal plane, 1-1/500 sec., T, B. FP-X synch. Cpld. r-f. Japan.

B. INTERMEDIATE

Contessa 35. $130. *Zeiss Tessar f*/2.8 45 mm. lens (satisfactory). *Compur Rapid,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Built-in photoelectric exposure meter. Lens not interchangeable. West Germany.

Karomat. $112.50. *Schneider Xenar f*/2.8 50 mm. lens (satisfactory). *Synchro Compur,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Lens not interchangeable. West Germany.

Leica IF. $139.50. *Elmar f*/3.5 50 mm. lens (variable). Focal plane, 1/25-1/500 sec., B. FP-M-X synch. West Germany.

Retina IIc. $132. *Schneider Xenon f*/2.8 50 mm. lens (good). *Synchro Compur,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Front section of lens removable and replaceable with auxiliary telephoto and wide angle components. West Germany.

Retina IIIc. $175. *Schneider Xenon f*/2 50 mm. lens (good). *Synchro Compur,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Front section of lens removable and replaceable with auxiliary telephoto and wide angle components. West Germany.

C. NOT RECOMMENDED

Diax IIb. $149.50. *Schneider Xenon f*/2 50 mm. lens (satisfactory). *Synchro Compur,* 1-1/500 sec., T, B. F-M-X synch. Cpld. r-f. Stamped parts weak. West Germany.

Vitessa L. $159.50. *Ultron f*/2 lens (poor). *LVS Compur,* 1-1/500 sec. M-X synch. West Germany.

Voigtlander Prominent. $157.50. *Color Skopar f*/3.5 50 mm. lens (satisfactory). *Synchro Compur,* 1-1/500 sec., B. M-X synch. Cpld. r-f. Accepts only *Voigtlander* interchangeable lenses. West Germany.

Single-lens reflex, 35 mm.

A. RECOMMENDED

Contaflex III. $176. *Zeiss Tessar f*/2.8 50 mm. lens (good). *Synchro Compur* shutter, 1-1/500 sec., B. M-X synch. Self-timer. Cpld. r-f. West Germany.

Exakta VX Auto IIa. $399. *Zeiss Biotar f*/2 50 mm. lens (poor to good). Focal plane shutter, 12-1/1000 sec., T, B. FP-X synch. Cpld. r-f. Had automatic diaphragm. Germany (Russian Zone).

Tower 23. $77.50. *Asahi-Kogaku Takumar f*/3.5 50 mm. lens (good). Focal plane, 1/25-1/500 sec., B. FP-X synch. Japan.

B. INTERMEDIATE

Alpa 7. $399. *Switar f*/1.8 50 mm. lens (good). Focal plane, 1-1/1000 sec., T, B. FP-X synch. Cpld. r-f. Range-finder window is poorly located. Switzerland.

Alpa 5. $339. *Schneider Xenon f*/1.9 50 mm. lens (satisfactory). Focal plane, 1-1/1000 sec., T, B. FP-X synch. Range-finder window is poorly located. Switzerland.

Alpa 4. $269. *Schneider Xenon f*/1.9 50 mm. lens (satisfactory). Focal plane, 1-1/1000 sec., T, B. FP-X synch. Range-finder window is poorly located. Switzerland.

Rectaflex. $329.50. *Schneider Xenon f*/2 50 mm. lens (variable). Focal plane, 1-1/1300 sec. FP-X synch. Very well made; with good lens, would be rated *A.* Italy.

C. NOT RECOMMENDED

Astra 35 FX. $74.50. *Zeiss Tessar f*/2.8 50 mm. lens (fair). Focal plane, 1/2-1/500 sec. FP-X synch. Sold under various names. Germany (Russian Zone).

Astraflex (see *Pentacon*).

Contax D or S (see *Pentacon*). Not to be confused with *Carl Zeiss Contax.* Germany (Russian Zone).

Hexacon (see *Pentacon*).

Pentacon (also called *Verikon*). $259.50.

Westagon. *f*/2 50 mm. lens (variable). Focal plane, 1-1/1000 sec. FP-X synch. Sold under several names at various prices. Variable workmanship. Germany (Russion Zone).

Praktica FX (see *Astra 35 FX*).

Praktiflex FX. $139.50. *Isco Westagon f*/2 50 mm. lens (variable). Focal plane, 1/2-1/500 sec. FP-X synch. Construction, not good. Germany (Russian Zone).

Rival 35 MX (see *Astra 35 FX*).

SUB-MINIATURE CAMERAS

These cameras are an attractive, appealing, compact novelty; the negatives they produce are so small — about ⅜ x ½ inches (roughly one quarter the area of regular 35 mm. negatives) —that coarse grain becomes a serious problem when enlargements of 4 x 5 or larger size are made, particularly when fast films are used, as would normally be desirable. Prices of these cameras range from $10 to $300. A *relatively* good buy in this category is the *Minolta 16* (list price about $39).

FOLDING ROLL-FILM CAMERAS

The folding roll-film cameras were once the predominant type; their sales now are very low compared to those of 35 mm. and twin-lens reflex cameras.

Except when otherwise noted, all the cameras listed in the group use No. 120 or No. 620 film to produce pictures 1⅝ x 2¼, 2¼ x 2¼, or 2¼ x 3¼. All were synchronized for flash.

A. RECOMMENDED

Super Ikonta (Zeiss Ikon) $99, with *Zeiss Tessar f*/3.5 lens. Cpld. r-f. Reduced to $69.50. Case, $10. 16 pictures 1⅝ x 2¼ on No. 120 film. West Germany.

Super Ikonta C (Zeiss) $114, with *Zeiss Tessar f*/3.5 lens. Cpld. r-f. Reduced to $79.50. Case, $10. Pictures 2¼ x 3¼ or 1⅝ x 2¼ on No. 120 film.

Voigtlander Bessa II, Range-Finder Model. $160, with *Color-Heliar f*/3.5 lens. 8 pictures 2¼ x 3¼ on No. 120 roll. West Germany.

B. INTERMEDIATE

Kodak Tourist II (Eastman) $46.75, with *Kodak Anaston f*/6.3 lens in *Kodak* shutter. Takes 8 pictures 2¼ x 3¼ on No. 620 roll.

Voigtlander Perkeo I. $19.75, with *Vaskar f*/4.5 lens in *Pronto* shutter. Takes 12 pictures 2¼ x 2¼ on No. 120 or No. 620 roll. West Germany.

"PICTURE-IN-A-MINUTE" CAMERAS

While cameras that take and develop pictures while you wait are not by any means a satisfactory substitute for a regular camera that uses standard film calling for skilled developing and printing, the picture-in-a-minute equipment does appeal to some amateurs who place prompt availability of the print above all else. These cameras have another important place. They can be very useful for real estate and insurance firms, advertising studios, and professional photographers who need a preliminary or trial picture to see how their layout and posing will look in a finished picture. In such uses, the quick availability of a usable print can be very important. Accessories are now being offered by the Polaroid Corp. that permit making of 2¼ x 2¼ lantern slides in the matter of a few minutes, at a cost of about 55 cents each for the 2¼-inch size. This facility, too, can be of great value for persons in certain special occupations and professions, including lecturers, teachers, and others.

The *A* ratings given the *Polaroid 110A* and *150* are to be regarded as qualified recommendations; the *A* rating in our judgment applies only for those users who regard the somewhat lower quality of the finished print, compared to a first-class print from a negative made by a camera of the usual type, fully compensated for by the advantages of the *Polaroid* quick development principle previously mentioned.

A. RECOMMENDED

Polaroid 110A (Polaroid Corp., Cambridge 39, Mass.) $169.50; flash unit, $13.95. *Rodenstock Ysarex f*/4.7 4-element lens. 127 mm. focal length. *Prontor LVS* shutter, 1/300 to 1 sec., B. M-X synch. Cpld. r-f. Picture size, 3" x 4". Cost per picture: *PolaPan 200,* about 25c; *PolaPan 400,* about 27c.

Polaroid 150 (Polaroid Corp.) $109.95; flash unit, $13.95. Three-element *f*/8.8 lens. 130 mm. focal length. *LVS* synch. shutter. Speeds to 1/100 sec., B. Cpld. r-f. Picture size, 3¼" x 4". Cost per picture: *PolaPan 200,* about 25c; *PolaPan 400,* about 27c.

B. INTERMEDIATE

Polaroid Highlander 80A (Polaroid Corp.) $72.75; flash unit, $12.95. Three-element *f*/9 lens. *LVS* synch. shutter. Picture size, 2⅜" x 3⅜". Cost per picture: *PolaPan 200,* 18.5c.

TWIN-LENS REFLEX CAMERAS

These cameras, as the name implies, have two lenses of the same focal length; one lens takes the picture, the other is for viewing, composing, and focusing the scene of which it projects a right-side-up image to a ground-glass focusing screen where it is seen in the same size as it will be in the finished picture. This arrangement has great advantages: the image is always in view, and its brightness is not diminished by stopping down of the taking lens. A disadvantage goes with the fact that as the viewing lens stays wide open the depth of field at different stop openings of the taking lens is not revealed on the focusing screen. The twin-lens reflex cameras are very popular, simple to operate, and with a little practice one can be pretty sure of coming back with a picture for almost every exposure (not true of some other popular kinds of cameras). The automatic twin-lens reflex camera has the added feature of advancing the film to its initial and subsequent exposure positions without exposure numbers having to be set in a window. This is a helpful feature but in no sense a vital one or worth many extra dollars. Certain models now have a built-in exposure meter coupled to the camera mechanism. CR does not recommend this feature, though it is open to less objection if the meter can easily be removed for repair without loss of use of the camera.

The twin-lens reflex camera lacks one feature that is a strong talking point of certain other types. It cannot ordinarily be used with interchangeable lenses, but the availability of interchangeable lenses is not normally important for anyone except advanced amateur photographers or professionals. Two Japanese twin-lens reflex cameras do offer interchangeable lenses, the *Tele-Koniflex* at $290, and the *Mamiyaflex* at $159.50 (not yet tested by CR).

The twin-lens reflex camera needs no range-finder; it can use color film to produce excellent color transparencies. One can buy adapters for the 2¼ x 2¼ inch cameras that will take 35 mm. or No. 828 film. Burleigh Brooks, Inc., 10 W. 46, New York City, now offers a *Super-Slide Kit* at $3.95, which permits making 1½ x 1½ transparencies on No. 120 film for mounting in 2 x 2 mounts so that they can be shown with 35 mm. slide projectors.

2¼ in. x 2¼ in., except as noted

A. RECOMMENDED

Rolleicord VA. $117.50, with case and three interchangeable dials and masks which permit taking five sizes of pictures from 35 mm. to 2¼" x 2¼". *Schneider Xenar f/3.5* 75 mm. lens (good). *Synchro Compur* shutter, 1-1/500 sec., B. M-X synch. Corrected for parallax. West Germany.

Rolleiflex 4 x 4 cm. $149.50, including case. *Schneider Xenar f/3.5* 60 mm. lens. *Synchro Compur LVS,* 1-1/500 sec., B. M-X synch. Uses No. 127 film to take 1½" x 1½" pictures. Not corrected for parallax. West Germany.

Rolleiflex Automat. $249.50, with case. *Schneider Xenotar f/3.5* 75 mm. lens (very good). *f/2.8* viewing lens. *Synchro Compur LVS,* 1/500-1 sec., B. M-X synch. Corrected for parallax. West Germany.

Rolleiflex Automat. $289.50. Same as above, but with built-in exposure meter.

Rolleiflex Automat 2.8 E. $331.50, including case. *Schneider Xenotar f/2.8* 80 mm. lens (very good). *Synchro Compur LVS,* 1-1/500 sec., B. M-X synch. Built-in exposure meter. Corrected for parallax. West Germany.

B. INTERMEDIATE

Flektar. $16.95, with case and flash gun. *ROW Pololyt f/3.5* 77 mm. lens (fair). *Blitz,* 1/25-1/100 sec., B. X synch. Not corrected for parallax. Good value in view of its very low price. Germany (Russian Zone).

Graflex 22. $74.50. *Graftar f/3.5* 85 mm. lens (fair). *Century,* 1/10-1/200 sec., T, B. X-F-M synch. Not corrected for parallax.

Ikoflex 1b. $99. *Novar f/3.5* 75 mm. lens (fair). *Prontor SVS,* 1-1/300 sec. M-X synch. Not corrected for parallax.

Ikoflex 1c. $146. *Zeiss Tessar f/3.5* 75 mm. lens (good). *Prontor SVS,* 1-1/300 sec. M-X synch. Not corrected for parallax. Built-in exposure meter.

Kalloflex Automat K2. $119.50. *Prominar f/3.5* 75 mm. lens (good). *Seikosha,* 1-1/500 sec., B. F-M-X synch. Not corrected for parallax. Shutter not protected against dirt. Japan.

Minolta Autocord. $99.50. *Rokkor f/3.5* 75 mm. lens (good). *Optiper,* 1-1/400 sec., B. M-X synch. Not corrected for parallax. Shutter not protected against entrance of dirt. Japan.

Minolta Autocord, Model L. $124.50; case, $11. *Rokkor f/3.5* 75 mm. lens (fairly good). *Seikosha,* 1-1/500 sec., B. M-F-X synch. Not corrected for parallax. Shutter not protected against entrance of dirt. Japan.

Super Ricohflex. $19.95; case, $5. *Ricoh Anastigmat f/3.5* 80 mm. lens (fair). *Riken,* 1/10-1/200 sec., B. F-X synch. Not corrected for parallax. Japan.

Walzflex II. $70, with case and exposure meter. *Kominar f/3.5* 75 mm. lens (fair). 1-1/300 sec., B. X-F-M synch. Not corrected for parallax. Japan.

Wardflex II. $47.50, with case. *Biokor f/3.5* 80 mm. lens (fair). 1-1/300 sec., B. X-F-M synch. Not corrected for parallax. Japan.

Yashica A. $29.95. *Yashima f/3.5* 88 mm. lens (fair). *Copal,* 1/25-1/300 sec., B. X synch. Not corrected for parallax. Shutter not protected against dirt. Japan.

C. NOT RECOMMENDED

Bolsey C. $89.50. *Wollensak f/3.2* 44 mm. lens (poor). *Wollensak,* 1/10-1/200 sec., T, B. X synch. Corrected for parallax. Uses 35 mm. film.

Minoltacord. $79.50. *Promar SIII f/3.5* 75 mm. lens (fair). *Optiper,* 1-1/400 sec., B. M-X synch. Not corrected for parallax. Shutter not protected against entrance of dirt. Japan.

CAMERAS WITH BELLOWS and focusing screen

Cut-film and film-pack or press-type cameras are cameras with folded bellows and a ground-glass screen on which the user may see a full size but inverted image, when he wishes to take the trouble of accurately focusing and composing the scene. Many such cameras are fitted with coupled range-finders and view-finders, so that they can be used without ground-glass focusing when desired. Some have one of the between-the-lens-type shutters and one of the focal-plane type, both synchronized for flash.

With cameras of the type used by professionals and newsmen and utilizing cut film, the photographer may process individual pictures immediately without having to wait until a roll of film is finished. Further advantages are: large pictures, ready interchangeability of lenses, and, on some cameras, long bellows extension for close-ups and copying of pictures or drawings. A few, such as the *Super Graphic 45* and *Linhof*, are equipped with tilts and swings to correct faulty perspective on certain specialized and professional types of photography.

A. RECOMMENDED

Busch Precision Pressman (Busch Camera Corp., Chicago 7) *Model 1C* (2¼ x 3¼), $119, less lens; *Model D* (4 x 5), $159, less lens. Spring-type back for *Graphic*-type holders.

Graflex Super D (Graflex, Inc., Rochester 8, N.Y.) 3¼ x 4¼, $335, with 6" *Kodak Ektar f*/4.5 coated lens in automatic diaphragm. A single-lens reflex.

Graphic View II (Graflex, Inc.) $190, without lens. 4 x 5. A well-made but high-priced camera of the "view" type.

Linhof Super Technika. 2¼ x 3¼ model, $390, less lens; 4 x 5 model, $495. Revolving back, swings, etc., like those of view cameras. West Germany.

Pacemaker Crown Graphic (Graflex, Inc.) $260-$293, depending on lens and shutter. 3¼ x 4¼ and 2¼ x 3¼ models. Like the *Speed Graphic*, except that focal-plane shutter is not included; cost is about $45 below corresponding *Speed Graphic* models.

Pacemaker Speed Graphic (Graflex, Inc.) $293-$334 (approximately), depending on lens and shutter. 2¼ x 3¼ and 3¼ x 4¼. All models available with both focal-plane and inter-lens shutters. *Graphic* or *Graflex* back; latter takes plate or sheet-film magazines, as well as double plate or sheet-film holders.

Super Graphic 45 (Graflex, Inc.) $361-$394, depending on lens and shutter. 4 x 5. Revolving back, tilts and swings.

B. INTERMEDIATE

B & J Speed Press (Burke & James, Inc., Chicago 1) $79.50 for 2¼ x 3¼ model; $109.50 for 4 x 5 model; both less lens.

Century Graphic (Graflex, Inc.) $138, with *Graftar f*/4.5 coated lens in automatic-type shutter. 2¼ x 3¼ pictures. Fitted to take the *Graphic "23"* roll-film holder ($25). Quality of lens, mediocre.

STEREOSCOPIC CAMERAS

Before buying any stereo equipment, the purchaser should make certain that he will be able to "see" the pictures as stereo images. (Many persons are unable to accomplish the fusion of the two images to form one picture with three-dimensional quality or depth, and for such persons the stereo camera will be of no value or interest.)

These cameras have two lenses spaced about 2½ inches apart, taking two pictures of the same scene simultaneously, usually on 35 mm. film, to form a "stereo pair." These pairs, when viewed (or projected) with the proper equipment, produce an image that gives a very realistic impression of depth (three dimensions). A good stereo camera will cost $125 or so, and a first-class viewer about $20. A pair of finished 35 mm. stereo color pictures in slide form costs about 50 percent more than a single-picture color slide.

A hand-held binocular viewer is the most economical, and in some respects the most satisfactory equipment for viewing. Use of a projector ($87.50 to $595) requires very careful and accurate mounting of the transparencies, and often, too, adjustment of the projector for each slide; on the whole, stereo projectors have not proven very satisfactory.

A—

Revere 33 Stereo Camera (Revere Camera Co., Chicago 16) $175, with *f*/3.5 *Amaton* (Wollensak) lenses of 35 mm. focal length. Viewer, $18.50.

Stereo Realist 1041 (Realist, Inc., Milwaukee 12) $129; viewer, $19.75. *f*/3.5 *Anastigmat* lenses of 35 mm. focal length were of fairly good quality.

B. INTERMEDIATE

Kodak Stereo (Eastman Kodak Co., Rochester 4, N.Y.) $89.50; case, $10.25. *f*/3.5 *Kodak Anaston* lenses of 35 mm. focal length, of fair quality. Plastic body.

View-Master Personal (Stereocraft Engineering Co.; distributed by Sawyers Inc., Portland 7, Oreg.) $89.50; case, $9.75; viewer, $2; film cutter for mounting stereo pairs, $14.75. Picture size, about 13 x 13 mm. Camera equipped with fixed-focus *f*/3.5 *Anastigmat* lenses of 25 mm. focal length, of fairly good quality.

C. NOT RECOMMENDED

Stereo Colorist II (Bell & Howell Co., Chicago) $69.50. *f*/3.5 *Rodenstock Stereo-Trinar* lenses of 35 mm. focal length had fair resolution, and considerable astigmatism. Film-advance mechanism, poor (some pictures overlapped). Germany.

Linex (Lionel Corp., N.Y.C.) $44.50.

STEREO VIEWER

A. RECOMMENDED

Kodaslide Stereo Viewer II (Eastman Kodak Co., Rochester 4, N.Y.) $23.75. Takes standard stereo mounts (1⅝ x 4). Operates on 115 volts, with built-in brightness control and convertible to 2 D-size batteries. An excellent viewer. ¶Eastman's *Stereo Viewer I* at $12.75 had similar features, except that it had the much less desirable uncorrected lenses, and was for battery operation only.

LENSES

The primary requirement for a good lens is that it shall produce clear-cut images of an object containing fine details; this property is related to the resolving power of the lens.

There are many ways in which the inherent sharpness characteristic of a good lens can be lost or impaired. In using the camera (1) it may not be held steady; (2) shutter speed selected may be too slow for the action or movement photographed or the user's ability to hold the camera steady; (3) the film may be of a type or processed in a developer which gives coarse grain; (4) the range-finder may not be accurate, or the focal plane and viewing screen (on reflex cameras) may not be the same distance from the lens; (5) the lens of the enlarging equipment may not be first class, focussed correctly, and maintained free of vibration.

It is always wise to use a lens shade of proper design to diminish or eliminate the stray light which strikes the lens and may be reflected in a way to reduce the brilliance of the image by lessening contrasts and impairing shadow detail.

Contrast has an important effect on apparent sharpness. A negative of too low contrast will not show fine resolution even with the best of lenses. *A poor lens cannot produce sharp pictures, but an excellent lens incorrectly used or not correctly adjusted to the camera can produce unsharp pictures.*

Many have been led to suppose that color pictures call for a special lens. This is not true. The color correction of a lens determines the *sharpness* of pictures (in either black and white or color), not the color quality in the transparency.

Silicone-treated tissues, often used for spectacle lenses, should never be used for cleaning coated lenses on cameras and projectors.

Resolving power

Resolving power or resolution of a lens, as reported by CR, is expressed in terms of lines per millimeter that can be seen as separate lines on the negative.

An ideal lens would show the same resolving power at every point of its field, and at every aperture, but all actual lenses fall far short of this ideal. It is wise to avoid selecting a camera with a fast lens unless a high lens speed is necessary and its disadvantages realized. Lenses are fairly judged on their performance at full aperture (wide open) in terms of the resolution of the most poorly defined part of the field.

A good lens should resolve in lines per millimeter 100 times 25.4 divided by its focal length in millimeters. For a 50 mm. lens, required resolution would be 100 × 25.4 ÷ 50, or 50 lines per millimeter. For a 75 mm. lens, about 30 lines per millimeter. Claims of resolution much higher than these figures can be very misleading. There may be something special about the test method; for example, one manufacturer has advertised 125 lines per millimeter for his lens, but neglected to state that this was obtained at the center of the field and by the projection method (which does not take into account the loss in resolving power in the film).

Lenses that give noticeably poor resolution on black-and-white film may seem to give a satisfactory image on color film. Color film gives a higher apparent resolving power, due to the extra element of contrast afforded by images in color.

Ultra-fast lenses

Today the amateur has very little need for "fast" and "ultra-fast" lenses, and such uses as these lenses may have had in the past have largely vanished with the advent of films such as *Tri-X*, *Super Anscochrome*, and the universal use of synchronized flash. Lenses of *f*/3.5 used with *Tri-X* film can take pictures that formerly required an *f*/1.5 or *f*/2 lens. The amateur should bear in mind that most *f*/2 or faster lenses stopped down to *f*/3.5 or *f*/4.5 will not give better, or in many cases as good, definition than good *f*/3.5 or *f*/4.5 lenses used at full aperture. Few have actual use for lenses faster than *f*/3.5 or even *f*/5.6, since with such lenses good color pictures can be taken at 1/50 second in favorable light, and with fast black-and-white film and the new very fast color film, for many exposures the lens will even need to be stopped down to a smaller aperture of *f*/22 or *f*/16 with the shutter set for a 1/100-second exposure. (Stopping down a lens to a small aperture while often very desirable to increase depth of field, does not improve resolution.) The fast lenses have the disadvantage of greatly decreased depth of focus (sharp focus limited in depth to a narrow zone). An *f*/1.4 lens used wide open, for example, will have a total depth of focus of only 2½ thousandths of an inch. Thus unsharpness when due to out-of-focus conditions will be apparent when the film deviates slightly from a true plane or the lens is not focused precisely.

In sum, it is a waste of money to buy a lens faster than is really needed, for the slower, less expensive lenses of first-class makers will usually give better definition at the apertures most commonly used.

Testing a lens

Those who wish to test their own lenses should obtain Bureau of Standards Circular No. 533, Method for Determining the Resolving Power of Photographic Lenses, complete with charts at $1.25, from Superintendent of Documents, Washington 25, D.C. Extra set of charts, 75 cents. An alternative method is to make practical tests using a fine-grain film of the type which will normally be used, with the camera firmly held on or clamped to a solid object. Pictures should be taken with the focus set at infinity on such objects as brick or shingled walls of buildings. An excellent test object for closer views is a number of magazine advertising pages with large type or diagrams fastened to a wall or other flat surface, taken at such a distance that they completely fill the negative area. In this test, the camera must be focused carefully and the camera adjusted in position so that the plane of the film is parallel to the wall. As underexposure and overexposure affect grain and contrast which in turn affect resolution, several shots should be made at different exposures. The resulting negative will show a certain *photographic resolution* that is the net of the resolving power of the lens and that of the emulsion of the film, and the accuracy of lens position and alignment. To determine the quality of the picture produced, an enlarged print of the best (properly exposed) negative should be made, at a magnification of 10 divided by the focal length of the lens in inches.

Enlarging lenses

For best results, the focal length of an enlarger lens should be the same as that of the camera lens that made the negative.

Types of lenses

Lenses with three elements, known as "triplets," are cheap to produce, and for the most part poor in performance (triplets may be as fast as *f*/2.5 to *f*/4.5 in the form of 50 mm. focus lenses for 35 mm. cameras). In general, lenses that focus by rotation of the front element will not give as sharp pictures as lenses of similar grade that focus by movement of the entire lens.

Well-made lenses of the type of the original *Tessar* design can be excellent in focal lengths up to about 6 inches and *f*/4.5 aperture. Some current *f*/3.5 *Tessar*-type lenses, in moderate focal lengths, are satisfactory.

The best *f*/3.5 lenses used as original equipment on amateur cameras are of 5-glass construction; the Dallmeyer *Pentac,* the Voigtlander *Heliar,* and *some* forms of the Eastman Kodak *Ektar* are of this construction. Some of the superfast lenses used on certain miniature cameras are made with 6 to 10 glasses.

Any modification of the focal length of the basic camera lens will, to a degree, destroy its precision. On this account, supplementary lenses designed to increase or decrease the focal length of a lens are sure to produce notable impairment in the sharpness of the picture.

A few current and older camera lenses are listed below, classified by type. An asterisk preceding a lens name indicates that it is believed to have been discontinued.

Triplets	**Quality**
Anaston, *f*/3.5 (Eastman Kodak)	Fairly good
Anaston, *f*/4.5, *f*/6.3 (Eastman Kodak)	Poor to fair
Apotar, *f*/4.5 (Agfa)	Fair to good
Cassar, *f*/2.5 to *f*/5 (Steinheil)	Poor to fair
Cintar, *f*/3.5 (Argus)	Poor to good
***Helomar,** *f*/3.5 (Voigtlander)	Fair
***Kodak Anastigmat,** *f*/4.5, *f*/6.3 (Eastman Kodak)	Poor to fair
Novar, *f*/3.5 to *f*/6.8 (Carl Zeiss)	Fair (pre-war lenses)
Novar, *f*/3.5, *f*/4.5 (Zeiss-Opton)	Fair (improving)
Paragon, *f*/3.5 (Ilex)	Pre-war poor, but on postwar *Stereo Realist,* good to excellent
Radionar, *f*/2.9 to *f*/6.3 (Schneider)	Poor
Trinar, *f*/2.9 to *f*/6.3 (Rodenstock)	Poor
Trioplan, *f*/2.8 to *f*/6.3 (Meyer)	Poor
Trioptar, *f*/4.5 (Wollensak)	Fair
Triotar, *f*/2.9 to *f*/6.3 (Carl Zeiss)	Poor to fair
Varex, *f*/4.5 (Argus)	Poor to good
Vaskar, *f*/4.5 (Voigtlander)	Fair
***Voigtar,** *f*/3.5 to *f*/6.3 (Voigtlander)	Poor to fair

Tessar types	
Anastar, *f*/3.5, *f*/4.5 (some types) (Eastman Kodak)	Fair to excellent
***Anticomar,** *f*/4.2 (Plaubel)	Good
Color-Skopar, f/3.5 (Voigtlander)	Poor to excellent
Ektar, *f*/4.5, *f*/4.7 (some types) (Eastman Kodak)	Fair to good
Elmar, *f*/3.5 (Leitz)	Poor to excellent
***Kodak Anastigmat,** *f*/4.5 (some types) (Eastman Kodak)	Fair

Tessar types	Quality
***Kodak Anastigmat Special,** *f*/3.5, *f*/4.5 (some types) (Eastman Kodak)	Fair to excellent
Raptar, Ser. II, *f*/4.5 (Wollensak)	Fair
***Skopar,** *f*/3.5 (Voigtlander)	Poor to good
***Skopar,** *f*/4.5 (Voigtlander)	Pre-war, good to excellent
Solinar, *f*/4.5 (Agfa)	Fair
Tessar, *f*/2.8 (Carl Zeiss)	Poor to good
Tessar, *f*/3.5 (Carl Zeiss)	Fair to good
Tessar, *f*/4.5 (Carl Zeiss)	Fair to excellent (pre-war)
***Tessar,** *f*/6.3 (Carl Zeiss)	Excellent
Tessar, *f*/3.5 (Zeiss-Opton)	Fair to good
***Velostigmat, Ser. II,** *f*/4.5 (Wollensak)	Pre-war, poor; post-war, fair
Xenar, *f*/3.5, *f*/4.5 (Schneider)	Pre-war, excellent; post-war, fair to excellent

Five-glass lenses	
Apo-Lanthar	Very good
Color-Heliar, *f*/3.5 (Voigtlander)	Excellent
Ektar, *f*/3.5 (some types) (Eastman Kodak)	Good to excellent
Heliar, *f*/3.5, *f*/4.5 (Voigtlander)	Excellent
Hexanon, *f*/2.8	Good
Pentac, *f*/2.9 (Dahlmeyer)	——
Xenotar, *f*/2.8 (Schneider)	Very good
Xenotar, *f*/3.5 (Schneider)	Very good

The following are fast and superfast lenses of various constructions; these are a few that are good: *Kern Switar, f/1.8*; *Nikkor H-C, f/2*; *Serenar, f/1.8* (Canon); *Xenon C, f/2.8* (Schneider).

FLASH PHOTOGRAPHY

Even the cheapest cameras today are equipped with built-in synchronization for flash. Adding synchronization to an existing shutter, however, is an expensive job and hardly worth doing with any but very superior lenses and shutters. Equipping the shutter of one of the older cameras for flash will cost from $15 to as high as $45, depending upon the type of shutter and the shop doing the work.

Depending on the type of flash bulb used, the opening of the shutter must be delayed 5 or 20 thousandths of a second after the lamp circuit is energized to permit the bulb to reach its maximum or peak brilliance. Cameras that have non-adjustable synchronization are usually set for X or O delay and are limited to taking pictures at 1/25 or 1/50 second with flash bulbs.

A *fully synchronized* shutter can be used with slow or fast shutter speeds, and has a lever for adjusting the synchronization to the type of bulb in use. The lever positions may be marked X, F, M, or 0, 5, 20. The X or 0 position is for use with electronic flash. The F position is for SM or SF bulbs and most M-2 bulbs. The M position is for Class M or medium-peak bulbs and *Westinghouse M-2's*. FP bulbs are for focal-plane shutters at any shutter speed.

There are a number of mechanical devices sold for attachment to shutters of old cameras to provide synchronization. These are not recommended.

Battery-capacitor units

The battery-capacitor (B-C) flash guns are much to be preferred to the older guns operated by two or three flashlight cells, which often failed to fire the flash bulb. B-C units ordinarily use a 22½-volt battery to charge a capacitor which stores a large amount of electrical energy (more than ample to fire one or several bulbs).

A. RECOMMENDED

Taron (Distributed by Lafayette Radio, 100 Sixth Ave., N.Y.C.) $4, with condenser and leather case. 22½-volt battery, 95c. Folding-fan-type reflector, built-in test lamp. Japan.

Electronic flash equipment

The ECPS (Effective Candle Power Seconds) rating now being given by some manufacturers is the most useful and valid standard of comparison of the light-output of electronic flash units.

Do not purchase any electronic flash gun unless it is tested and "listed" by Underwriters' Laboratories, and never use outdoors during rain or damp conditions a flash gun of the type that is connected to power circuits. There are few amateurs who can actually justify the purchase of electronic flash equipment, for few take enough pictures to make the use of an electronic gun economical. Even the lowest priced ones, sold at around $30, are not warranted, considering today's low prices of flash bulbs and the fact that electronic flash guns may carry a great hazard, even cause death, due to the stored charge of electricity.

COLOR PHOTOGRAPHY

The 35 mm. color film makes excellent transparencies for projection. On the other hand, making quality prints or enlargements from these transparencies leaves much to be desired. Duplicates of the original transparencies were very rarely equal in quality to the originals.

Eastman Kodak Company has announced the

availability of *Kodacolor* film in the 35 mm. size. This film used in conjunction with the new panchromatic printing paper, *Kodak Panalure,* will permit the photographer to obtain from a single exposure of *Kodacolor* black-and-white prints as well as good quality color prints. Just how the quality of the color transparencies that are later to be available from *Kodacolor* originals will compare with the quality of transparencies made on *Kodachrome, Ektachrome,* and *Anscochrome* (which are positive films) is not known at this time. One thing is certain, the price of pictures by the new method will be high. The total cost of a 20-exposure roll of 35 mm. *Kodacolor,* of processing the film, of 20 35 mm. color prints, and of 20 color transparencies may run to as high as $12.50. (Prices of black-and-white prints on *Panalure* were not available as this was written.)

Slides larger than 35 mm. ("Super Slides" 1½ x 1½ and 2¼ x 2¼ slides) have the disadvantage that the cardboard mounts are not stiff enough to support the transparency without buckling. The large slides must therefore be mounted in glass, increasing the cost and creating problems with storage and breakage.

Color film

There is no such thing as correct color rendition with color film. The effect is at best an approximation, and sometimes only a fair one. The choice between *Kodachrome* and *Ektachrome* is, therefore, a matter for personal decision. *Ektachrome* and *Anscochrome* are about three times as fast as *Kodachrome,* and *Super Anscochrome* is about ten times as fast as *Kodachrome;* the higher speeds permit use of smaller diaphragm openings, often very advantageous, but preclude use of the very fast film in many cheap, simple cameras. The difference between *Kodachrome* and *Ektachrome,* other than speed, is that *Kodachrome* gives colder tones with the greatest brilliance in the blues and greens, while *Ektachrome* gives warmer tones, with particular emphasis of the yellow and red portions of the color scale. *Kodachrome* has notably less grain than *Ektachrome* or *Anscochrome.*

One type of color film (with the correct filter or type of flash bulb) can be used for outdoor and indoor pictures—and this is important to many amateurs who wish to take pictures under all conditions on the same roll of film. However, use of a single type of film will not give quite as good color rendition as is obtained when the films are used for the specific light conditions for which they are designed.

Where film speed is important, it is better to use the Type F indoor film for all purposes, as the speed loss is less than when daylight film is used indoors. Daylight (outdoor) film used indoors with blue flash lamps has only about half the speed of *Kodachrome Type F* used with clear flash lamps. Daylight film used with blue flash lamps requires one stop more exposure than Type F film of the same kind with clear lamps.

The new very fast *Daylight Super Anscochrome* used indoors with blue flash lamps is approximately 50 percent faster than *Ektachrome Type F* film with clear flash lamps.

Processing of color film

Prepaid mailing bags are now available from dealers which permit the photographer to mail his film to the processor as soon as the roll is exposed and have it returned to his home by mail. For factory processing of *Kodachrome,* prepaid processing mailers can be purchased from *Kodak* dealers at a price equivalent to the processing charge ($1.60 for 20 exposures, 35 mm. roll). With these mailers, the consumer can send his exposed film direct to the nearest *Kodachrome* processing laboratory, and have it returned to his home or other specific address. This method eliminates the delay and inconvenience previously caused by having to take the film to the dealer and to call for it later when the film was returned to the dealer by the processor. Some color-film processors will supply free mailing envelopes and price lists upon request, to enable the user to enclose the correct amount of money with his film and have the finished transparencies returned to his home.

A. RECOMMENDED

Ansco, Binghamton, N. Y.

Eastman Kodak Co., Rochester, N. Y.

Master Color Labs., GPO Box 30, Newark 1, N. J. (Mailing envelopes supplied on request.)

Technicolor, 533 W. 57 St., New York 19 and 6311 Romaine St., Hollywood 38, Calif.

Storage of color film

High temperature and high humidity cause deterioration of color film whether in or out of the camera. Very high temperatures can be reached in the glove compartment of a car or on the back shelf or other part of a car closed on a hot day. Unopened film should be kept in the refrigerator and removed 24 hours before it is to be used. Exposed film should be developed as soon as possible. These precautions are wise for black-and-white film also.

Filter recommendations for color films

	Lighting by					
	Daylight		Flash		Photoflood	
Brand and type designation	A.S.A. Index	Filter	Guide No.*	Type	A.S.A. Index	Filter
Kodachrome Daylight	*10*	*None required*[1]	*45*	*Blue flash lamps*	*2.5*	*80A*
Kodachrome Professional, Type A[3]	*10*	*85*	*80*	*81C with clear flash lamps*[4]	*16*	*None required*
Kodachrome, Type F	*10*	*85C*	*95*	*Clear flash lamps*	*10*	*82A*
Ektachrome Daylight	*32*	*None required*	*95*	*Blue flash lamps*	*10*	*80B*
Ektachrome, Type F	*20*	*85C*	*120*	*Clear flash lamps*[2]	*16*	*82A*
Anscochrome Daylight	*32*	*None required*	*95*	*Blue flash lamps*	*8*	*Ansco No. 10 or 80A*
Anscochrome, Tungsten	*25*	*85*	*120*	*81C with clear flash lamps*	*32*	*None required*
Super Anscochrome Daylight	*100*	*None required*	*170*	*Blue flash lamps*	—	*80A or equivalent*
Super Anscochrome, Tungsten	*100*	*85B*	*220*	*81D with clear flash lamps*	*100*	*81A*
Kodacolor C	*32*	*None required*	*120*	*Clear flash lamps*	*25*	*None required*

[1] *Kodak Skylight Filter No. 1A* can be used to warm up tones (reduce the tendency toward bluishness).
[2] With M-2 lamps, use No. 81 filter; with SM and SF lamps, use No. 82B filter.
[3] Available only in 36-exposure rolls.
[4] The 81C filter should not be used with SM and SF bulbs.
* With No. 5 or 25 bulbs at 1/25 second.

Color slides should be stored in a dry place, otherwise they pick up moisture and when projected may give trouble from "popping" out of focus as the moisture is evaporated by the heat of the projector. Popping is more likely to occur when the projector heats the slides excessively, as a good many do.

SLIDE PROJECTORS

The two most important qualities of a projector are a lens with good resolution and an optical system that provides even illumination and does not subject the slides to excessive heat, which is injurious to the slides. For home use, 300-watt projectors are the most popular. 500-watt projectors are best for 2¼ x 2¼ or larger slides and for projection on larger screens in halls or auditoriums. Some projectors are designed to preheat the slides to prevent the slides from popping out of focus when being projected. See "Storage of color film," pages 76-77.

Projectors are available in three sizes: (1) for 2 x 2 inch slides in which 35 mm. double-frame, *Bantam*-size, or 1½ x 1½ inch ("Super Slides") transparencies are mounted, (2) for 2¾ x 2¾ inch slides used for mounting 2¼ x 2¼ inch or smaller transparencies made on No. 120 or No. 620 film, and (3) for 3¼ x 4 inch standard lantern slides. The larger projectors can be used for 35 mm. and *Bantam*-size film by the use of suitable masks, but are not as efficient optically as a good projector that was designed for the smaller size.

A.S.A. standards do not specify a minimum acceptable resolving power for the lens or the minimum light output in lumens. They permit a minimum corner-to-center ratio of illumination of 65 percent (a really good projector should give a ratio of *80 to 90 percent*). A.S.A. standards also err in permitting the temperature of the film slide to be as high as 212°F; Consumers' Research deems this much too high.

There are several advantages in buying a projector for semiautomatic or automatic operation over a projector in which the slides must be fed by hand: (1) No problem of locating slides in the dim light available to the projectionist; (2) slides are less likely to get out of order or be shown upside down or reversed left to right; (3) slides, once they are arranged in trays, need not be handled individually, hence need not be mounted in glass or metal mounts (the saving more than pays for the cost of the trays).

Many existing projectors can be converted to semiautomatic operation by the addition of an accessory slide changer (see listings, page 79, 80). In these changers, 30 or 36 slides are loaded into a tray with numbered partitions. Pushing a handle feeds the slide into the projector; pulling the handle out removes the slide, returns it to its compartment in the tray, and advances the tray for the next slide (on the *Selectron*, it is also necessary to turn a knob to advance the tray for the next slide). Accessories are also available for the *Selectron* and *Airequipt* for advancing the tray electrically. Additional trays or magazines can be purchased at 29 cents to $2.15 each, depending upon the make.

Fully automatic projectors change the slides automatically at the desired intervals of time. The time interval is adjustable to suit the viewers' convenience. These projectors can be operated semiautomatically, if desired, by pressing a key or button to change the slide.

Ratings are cr56, 57, 58.

Projectors for 2 x 2 in. slides

Non-automatic

B. INTERMEDIATE

Argus 300 (Argus Inc., Ann Arbor, Mich.) $39.50. See listing of *Argus "300" Model III*, which is the same projector with *Airequipt* slide changer.

Kodaslide Signet 500, Model 1 (Eastman Kodak Co., Rochester 4, N.Y.) $77.50; case, $11. Coated *f*/3.5 *Ektanon* lens of 5" focal length, focused by rotation of lens in helical mount. Equipped with 500-watt lamp, double condenser, and cooling fan. Light output, good; evenness of illumination, fair. Resolving power of lens, good. Temperature of slide, 190°F, somewhat high. Lens mount fitted rather loosely.

C. NOT RECOMMENDED

Minolta Mini (Distributed by The FR Corp., 951 Brook Ave., New York 51) $35; case, $2.55. Made in Japan. *Rokkor f*/2.5 lens of 75 mm. focal length. 100-watt lamp, triple condenser, and heat filter. Light output, good; evenness of illumination, poor. Resolving power of lens, very poor. Temperature of slide, 210° (too high).

Semiautomatic

A. RECOMMENDED

Headliner 706 (Bell & Howell, Chicago) $62.50, with semiautomatic *Selectron* changer and case. Coated *TDC Vivid f*/3.5 *Trionar Anastigmat* lens of 4" focal length. 300-watt lamp, blower-cooled; double condenser. Except for changer, same as *Headliner 706* listed under automatic projectors. An electric changer, at $32, permits converting this projector to automatic operation.

Kodak 300 (Eastman Kodak Co.) $64.50, with *Readymatic* changer; $74.50, with *Airequipt* changer. Coated *f*/3.5 *Projection Ektanon* lens of 4" focal length. 300-watt lamp, double condenser, and light filter. Light output, average; evenness of illumination, good. Resolution of lens, good, Temperature of slide, 115° (unusually low, which is desirable).

B. INTERMEDIATE

Argus "300," Model III (Argus Inc., Ann Arbor, Mich.) $62.50, with semiautomatic *Airequipt* slide changer and one magazine; manual changer for single slides; and carrying case. Capacity, 36 slides. Coated, color-corrected, triple-element *f*/3.3 lens of 4" focal length. 300-watt lamp, blower-cooled; triple condenser (one glass of the condenser is heat-absorbing).

Kodaslide Signet 500, Model I (Eastman Kodak Co.) $87.50; case, $11. Same as *Kodaslide Signet* listed under "Non-automatic," except for addition of slide changer.

LaBelle, Model 55 (LaBelle Industries, Inc., Oconomowoc, Wis.) $95; case, $14. Coated *f*/3.5 *Wollensak Series O Projection* lens of 5" focal length. 500-watt lamp, triple condenser, heat-absorbing glass, and cooling fan. Magazine feed, which operated satisfactorily. With more even illumination, this projector would warrant an *A* rating.

Revere, Model 444 (Revere Camera Co., 320 E. 21 St., Chicago 16) $69.50, with case. Lens, 5" coated *f*/3.5 *Wollensak Projection Anastigmat.* 300-watt lamp, double condenser, heat-absorbing glass, and fan. This projector is mechanically well designed, and with more even illumination would have warranted an *A* rating.

C. NOT RECOMMENDED

LaBelle Director (LaBelle Industries, Inc.) $70, with two slide magazines each holding about 115 cardboard-mounted slides; case, $9.95. Coated *f*/3.5 *Anastigmat* lens of 5" focal length. 300-watt lamp, blower-cooled; double condensers and a heat filter. Resolution of lens, poor. Temperature of slide, 188°F (high).

Project-O-Matic (Viewlex, Inc., Long Island City, N.Y.) $79.50, with case and six slide trays each holding 30 slides. Coated *f*/3.5 *Luxtar-OK Anastigmat* lens of 5" focal length. 300-watt lamp, blower-cooled; double condenser and a heat filter. Resolution of lens, poor. Temperature of slide, 190°F (somewhat high).

Automatic

A. RECOMMENDED

Headliner 706 (Bell & Howell) $86. Coated *TDC Vivid f*/3.5 *Trionar Anastigmat* lens of 4" focal length. 300-watt lamp, blower-cooled; double condenser; one element is also a heat filter. Resolving power of lens, good. Light output, average; evenness of illumination, good. Temperature of slide, 120° (low, desirable).

Keystone K-300 (Keystone Camera Co., Boston)

$77.50, with case and one slide tray. Formerly sold as *A. O. Executive 300.* Capacity, 40 slides. Coated *f*/3.5 lens of 5″ focal length. 300-watt lamp, blower-cooled; double condensers and a heat filter, easily removed for cleaning. Light output, good; evenness of illumination, fair. Resolving power of lens, fair. Temperature of slide, 163°F (satisfactory). Slide changer operated satisfactorily with all types of slide mounts.

Revere 888 (Revere Camera Co., Chicago 16) $144.50, with case and seven 36-slide magazines. Coated *f*/3.5 *Wollensak* 5″ lens. 500-watt lamp, triple condenser (one glass of which is heat-absorbing), and cooling fan. Light output, very good; evenness of illumination, fair. Resolving power of lens, good. Temperature of slide, about 185°F (somewhat high). The projector tested did not work satisfactorily, as received, but after it was repaired by the factory at no charge, it worked satisfactorily.

Revere 888D (Revere Camera Co.) $159.50, with case and seven slide trays. Similar to *Revere 888* except that *888D* will show 1½″ x 1½″ transparencies in 2″ x 2″ mounts without masking the corners, and has a preconditioning chamber to help prevent slides from popping out of focus.

Robomatic (Bell & Howell Co., Chicago) $149.50, with case, one slide tray with cover, and automatic timer. Capacity, 30 slides. Coated *f*/3.5 *Procomat Anastigmat* lens of 5″ focal length. 500-watt lamp, blower-cooled. Double condensers, heat filter. Light output, good; evenness of illumination, fair. Resolving power of lens, fair. Temperature of slide, 176°F (somewhat high).

C. NOT RECOMMENDED

Balomatic 500 (Bausch & Lomb Optical Co., Rochester, N.Y.) $149.50, with case; remote-control cord, $5. *f*/3.5 lens of 5″ focal length. 500-watt lamp, blower cooled; triple condenser and heat filter. Resolution of lens, fair. Light output, below average; evenness of illumination, poor. Temperature of slide, 210° (too high).

Graflex Constellation (Graflex, Inc., Rochester, N.Y.) $99.75, with *Airequipt* automatic changer, remote control, slide timer, and one slide tray; case, $10. Coated *f*/3.3 anastigmat lens of 4″ focal length. 500-watt lamp, blower-cooled. Light output, about average; evenness of illumination, fair. Resolution of lens, fair. Temperature of slide, 180°F (somewhat high). Changing mechanism did not operate satisfactorily (motor appeared to be underpowered).

Powermatic (Viewlex, Inc., Long Island City, N.Y.) $119.50, with case and six plastic slide trays; remote control cable, $4.95; automatic timer, $24.50. Coated *f*/3.5 *Luxtar P* lens of 5″ focal length. Double condenser and heat filter. 500-watt lamp, blower-cooled. Light output, below average; evenness of illumination, fair. Resolution of lens, fair. Temperature of slide, 180°F (somewhat high). Failed to pass standard proof-voltage test; otherwise would have received a *B-Intermediate* rating.

Projectors for 2¾ x 2¾ in. slides (2¼ x 2¼ in. and smaller transparencies)

Non-automatic

B. INTERMEDIATE

Streamliner 500 Duo (Bell & Howell Co., Chicago) $84.50; case, $9.50. Lens, *f*/3.5 of 6″ focal length. Equipped with 500-watt bulb, triple condensers, heat-absorbing glass, and fan for cooling. Had separate slide carriers for 2″ x 2″ and 2¾″ x 2¾″ slides (desirable). Resolving power of lens, very good. Light output, very good; evenness of illumination when projecting large slides, poor (corners were dark). Adequate cooling. If evenness of illumination were improved, an *A* rating would be warranted.

C. NOT RECOMMENDED

Dualet (Ansco, Binghamton, N.Y.) $40. Same as *Realist,* listed below.

Fleetwood, No. 1405 (Brumberger, 34 34th St., Brooklyn 32, N.Y.) $69.50, with one slide carrier (extra carriers for other sizes, $3.95); case, $9.95. Lens, 5″ coated *f*/3.5 *Wollensak Anastigmat Series O Projection.* 300-watt bulb, double condenser, heat-absorbing glass. Resolution of lens with 2¾″ x 2¾″ slides, poor; with 2″ x 2″ slides, fairly good. Light output, good; evenness of illumination, very poor.

Realist (David White Instrument Co., Milwaukee) $40, with adaptor for 2″ x 2″ slides. Lens, *f*/3.5 of 5″ focal length. 300-watt lamp, double condenser, and heat filter. Resolving power of lens, fair. Light output, below average; evenness of illumination, fair. Failed tests for electrical safety.

Streamliner 300 Duo (Bell & Howell Co.) $67.50. Case, $9.50. Lens, *f*/3.5 coated lens of 5″ focal length. 300-watt bulb, triple condensers, heat-absorbing glass, and fan for cooling. Had separate slide carriers for 2″ x 2″ and 2¾″ x 2¾″ slides (desirable). Resolving power of lens, fair. Light output, good; evenness of illumination when projecting large slides, poor (corners were dark). Adequate cooling.

Semiautomatic

C. NOT RECOMMENDED

Riviera, No. 1422 (Brumberger, Brooklyn 32, N.Y.) $75, with 2¼″ slide changer; 35 mm. manual slide carrier, $4; case, $15. Coated *Wollensak Anastigmat Series O f*/3.5 lens of 5″ focal length. 300-watt lamp, blower-cooled; double condenser and heat filter, not easily removed for cleaning. Light output, about average, for a 300-watt projector, with 2¼″ x 2¼″ transparencies, but poor for 35 mm. transparencies; evenness of illumination, poor. Resolution of lens, good in the center of the field, but very poor at the corners of 2¾″ x 2¾″ slides. Temperature of slide, 135°F (very satisfactory).

Slide changers for 2 x 2 in. slides

Changers are desirable for persons who have a large number of slides and for those who wish to reduce handling of slides to a minimum.

Semiautomatic

A. RECOMMENDED

Bell & Howell Selectron (Bell & Howell Co., Chicago) $12, with one slide magazine; extra magazines, 59c to 95c each. Magazine holds 30 slides in glass or cardboard mounts. Operation is similar to *Airequipt* except that a knob is turned to advance next slide. Relatively low cost of magazines makes this type very economical for those who have a large number of slides. Fits most *TDC* and *Bell & Howell* projectors. 1

Airequipt (Airequipt Mfg. Co., Inc., New Rochelle, N.Y.) $15, with one slide magazine; extra magazines, $2 each. Each magazine holds 36 slides in cardboard mounts only. A push-pull handle moves each slide in turn from magazine to projector, then back to magazine. Fits many, but not all, projectors. An electrically-operated remote control is available for $20. 2

Automatic

A. RECOMMENDED

Bell & Howell Electric Changer (Bell & Howell) $32. Fits only *Bell & Howell* and some *TDC* projectors. Changer is operated by pressing button on remote-control switch. Runs trays forward only.

PROJECTION SCREENS

Beaded glass screens which are in wide use for projection of color transparencies are not so satisfactory for many persons as screens with a dead-flat white surface or the new *Uniglow* surface. Beaded screens give a brighter image than flat white screens for those seated directly in front of the screen, but give a much duller image for those who, sitting off to one side, must view the screen at an angle greater than about 30 degrees from the line of projection. Screens with the smooth *Uniglow* surface give a bright image over a wide angle of view.

A metallized screen is needed for stereo projection (viewed with polarizing glasses), and is excellent for ordinary projection.

As transparencies are not all taken with the longest dimension horizontal, a square screen (40 x 40 inches is a good size) is necessary if it is desired to obtain the largest picture possible from both the horizontal and vertical format without having to move the projector.

The correct screen size depends upon the focal length of the projector lens and the distance of the projector from the screen. For example, at a distance of 10 feet a 3-inch lens will project a picture 54 inches wide; a 4-inch lens, 40 inches wide; and a 6-inch lens, 27 inches wide. Long focal length lenses are used in large halls and auditoriums where the projector must be located at a considerable distance from the screen.

The following are all tripod-mounted home projection type screens.

A. RECOMMENDED

Knox Coronet (Knox Mfg. Corp., Schiller Park, Ill.) Available with either beaded or matte-white surface. Size 30″ x 40″, $15; 40″ x 40″, $17; 37″ x 50″, $20; 50″ x 50″, $22.50. 1

Radiant Meteor Hy-flect (Radiant Mfg. Co., Morton Grove, Ill.) Beaded surface. Size 30″ x 40″, $13; 40″ x 40″, $15; 37″ x 50″, $19; 50″ x 50″, $21. 1

Width of screen required for 35 mm. transparencies

Distance of projector from screen in feet	10	15	20	25	30	35	40	45	50
Focal length of lens	Approximate width of screen, inches								
3″	54	80	108	135	162	188	216	242	270
4″	40	60	80	100	120	140	160	180	200
5″	32	48	64	80	96	115	130	145	160
6″	27	40	54	68	80	95	108	120	135
7″	23	34	46	58	70	80	92	105	115
8″	20	30	40	50	60	70	80	90	100

For 1½″ x 1½″ transparencies, multiply width of screen by 1.1.
For 2¼″ x 2¼″ transparencies, multiply width of screen by 1.7.

Da-Lite Challenger (Da-Lite Screen Co., Chicago) Beaded surface. Size 30″ x 40″, $26.75; 40″ x 40″, $28.75; 50″ x 50″, $36.75. 2

Radiant Imperial Champion (Radiant Mfg. Corp.) *Uniglow* (non-beaded) surface. Size 30″ x 40″, $30; 40″ x 40″, $32; 50″ x 50″, $40; 60″ x 60″, $55. 2

Da-Lite Picture King (Da-Lite Screen Co.) Available in beaded or matte-white surface. Size 52″ x 70″, $72.50; 70″ x 70″, $82.50. 3

SLIDE VIEWERS

Where normally only one person (in a few cases, two) may wish to look at a slide at a time, the lower-priced hand or table viewers are satisfactory. They sell at prices ranging from $1 to about $10. Satisfactory projectors are much more expensive, priced at about $35 up to $145.

Hand viewers

The following five viewers are of a design which permits viewing with both eyes at a normal viewing distance of about 10 inches.

A. RECOMMENDED

Arrow-View (Arrow Metal Products, 128 N. Jefferson, Chicago) $4.95.

Brumberger, No. 1225 (Brumberger Sales Corp., Brooklyn 32, N.Y.) $5.

Logan Magna-View, No. 210 (Logan Electric Spec. Mfg. Co., Chicago 22) $5.95. Essentially the same as *Brumberger No. 1225.*

Mico Vue (Mico Photo Products Co., 119 S. Dearborn, Chicago 3) $5.95; battery light attachment, $1.95.

B. INTERMEDIATE

Admiral (Admiral Photo Products Co., 1010 W. Lake, Chicago) $4.95.

* * *

The following viewers are to be held in the hand toward a window or light for viewing with one eye. The focusing type is to be preferred to the non-focusing type.

B. INTERMEDIATE

Guild Mini-Master (Craftsmen's Guild, Hollywood) 79c.

Kodaslide Pocket Viewer (Eastman Kodak Co., Rochester, N.Y.) $2.25.

Pak (LaBelle Industries, Inc., Oconomowoc, Wis.) $4.95.

C. NOT RECOMMENDED

Caspeco Dimensional Viewer (Camera Specialty Co., Bronxville 8, N.Y.) $3. Lens quality, poor.

Ultra-Vue (The Chromat-O-Scope Co., 426 S. Spring, Los Angeles) $1.50. Does not cover full slide (corners are cut off).

▶ **REF:** Bulletin, Dec. '54.++

Table viewer for 2 x 2 in. slides

The table viewer has the advantage that transparencies can be viewed without darkening the room and that the device can be set into operation with a minimum of trouble.

A. RECOMMENDED

Project-Or-View (Bell & Howell Co.) $77.50; case, $15 extra. Screen size, 6¾" square. Lens, *f/2.9* of about 3" focal length. 200-watt lamp and cooling fan. When used as a projector, the rating is *B. Intermediate.*

READY-MADE MOUNTS for 35 mm. color transparencies

A. RECOMMENDED

Brumberger (Brumberger Sales Corp., Brooklyn 32, N.Y.; Montgomery Ward's Cat. No. 67—3330) $1.49, plus postage, for 20. Two-piece, metal.

Emde (Emde Products, Inc., Los Angeles 25; Montgomery Ward's Cat. No. 67—3394) $1.75, plus postage, for 20. One-piece, metal.

B. INTERMEDIATE

Davidson Star-D (Davidson Mfg. Co., West Covina, Calif.) $1.55 for 20. Two-piece, metal. A good, lightweight mount except that corners were not uniformly rounded or finished off smoothly.

Esco (Erie Scientific Corp., Buffalo 10) $1.85 for 20. Three-piece (2 metal, 1 fiber). Newton's rings noted unless the transparency was trimmed to fit the mount.

Kwik Klik (Mansfield Industries, Inc.; Sears-Roebuck's Cat. No. 3—6432) $1.29, plus postage, for 20. Two-piece, metal. Newton's rings noted, as on *Esco,* and there was buckling of film unless the transparency was trimmed to fit the mount.

EXPOSURE METERS AND CALCULATORS

Exposure meters are useful for estimating the exposure required, but their use does not, as some suppose, guarantee correct exposures. Except under distinctly abnormal light conditions, experienced amateurs can estimate exposures with the aid of the instruction sheet that comes with the film, or one of the exposure guides listed later in this section, about as well as if they use a meter. Exposure meters made recently have light-value scales for use with cameras with so-called *LVS* shutters. There is no need for the average amateur to buy an expensive exposure meter, or to have an expensive one repaired, for there are a number of inexpensive Japanese and German meters on the market that are satisfactory. These are sold at prices well below the cost of repairing and readjusting the high-priced American meters, *GE* and *Weston,* for example. Two of the new inexpensive meters are listed below; others will be reported in a forthcoming Bulletin. American manufacturers are now coming out with low-priced photoelectric meters.

Photoelectric type

A. RECOMMENDED

DeJur Dual-Professional (DeJur-Amsco, Long Island City, N.Y.) $29.95; case, $2.25.

General Electric PR-1 (General Electric Co., Schenectady, N.Y.) $21.50, with case; incident-light hood, $1.50.

General Electric PR-3 (General Electric Co.) $34.50; *Dynacell* light multipler, $8; incident-light hood, $1.50. Has *LVS* numbers.

Norwood Director, Model B (Director Products Corp., 570 Fifth Ave., N.Y.C.) $33, with case.

Sekonic L-8b (Distributed by Brockway Camera Corp., New York 21) $8.95; "light amplifier" attachment, $3.50. Made in Japan. For reflected and incident-light readings. Has *LVS* numbers.

Weston Master III Universal 737 (Weston Electric Instrument Corp., Newark, N.J.) $30.

B. INTERMEDIATE

Actino (Distributed by Spiratone, New York 1) $5.95, with case. West Germany.

C. NOT RECOMMENDED

Used photoelectric meters, unless sold on a 10-day full-money-back basis.

Exposure guides and calculators

A. RECOMMENDED

American Standard Photographic Exposure Computer (American Standards Assn., 70 E. 45, New York 17) $1.50. Reliable guide for calculation of outdoor exposures.

Kodaguides (Eastman) 15c to 50c. Simple, reliable exposure computers available for different types of film and for outdoor and floodlight conditions.

Kodak Master Photoguide (Eastman) $1.65. A pocket-size booklet containing exposure computers, filter data, information on depth of field, portrait lenses, and data on *Kodak* black-and-white and color films (miniature, roll, pack, sheet).

ENLARGERS

An enlarger should be rigidly built and free from vibration.

A lens that is used for enlarging (or for copying) requires better correction, for the same sharpness of the image, than does a lense that is used to photograph an object at infinity or at relatively large distances (with respect to the focal length of the lens). Persons wanting high-quality enlargements should, therefore, select an enlarging lens with care.

The *f*/4.5 (or other large aperture) lenses should be stopped down to *f*/8 or a smaller opening for the exposure, as the field is not flat or sharp to the extreme corners when the lens is wide open.

Coated lenses are not as important for use on enlargers as some advertising claims would indicate.

A catalog available from Elwood Pattern Works, Inc., 125 N. East, Indianapolis 4, contains some general information on enlargers and enlarging which is valuable to the amateur.

A. RECOMMENDED

DeJur-Amsco Versatile I (DeJur-Amsco Corp., Long Island City, N.Y.) $136.50, with *f*/4.5 lens. Double condenser. Negatives to 2¼" x 3¼". Incorporates "negative tilt."

DeJur-Amsco Versatile II (DeJur-Amsco Corp.) $114.50, with *f*/4.5 lens. Similar to *Versatile I* except that it lacks negative tilt, and has single instead of double bellows.

Elwood Special, Model SP-25 (Elwood Pattern Works, Inc., Indianapolis) $165, with condensing reflector, less lens. Negatives to 5" x 7".

Kodak Flurolite (Eastman Kodak Co., Rochester, N.Y.) $100, less lens. Fluorescent light. Negatives to 2¼" x 3¼".

Leitz Focomat 1-C (E. Leitz; made in Germany, West Zone) $138, less lens. Automatic focusing. Negatives to 40 x 40 mm.

Omega A-2 (Simmon Bros., Inc., Long Island City, N.Y.) $116.50, less lens, but including "color head." For 35 mm. negatives.

Omega B-8 (Simmon Bros., Inc.) $152.50, less lens. Double condenser. Negatives to 2¼" x 3¼".

Omega D II (Simmon Bros., Inc.) $227.50, less lens. "Color head," $16.85. Double condenser. Negatives to 4" x 5".

B. INTERMEDIATE

Elwood Studio, Model S-2 (Elwood Pattern Works, Inc.) $79, less lens. Diffusion type. Negatives to 5" x 7".

Solar 57D (Burke & James, Chicago) $92.50, less lens. Diffusion type. Negatives to 5" x 7".

* * *

Federal 290 (Federal Mfg. & Engineering Corp., Brooklyn 5, N.Y.) $40, with *f*/6.3 lens and diffusion illumination system. Negatives to 2¼" x 3¼".

Fotolarger Master E (Testrite Instrument Co., Inc., New York 3) $50, with *f*/4.5 lens. Negatives to 2¼" x 3¼".

Kodak Hobbyist (Eastman) $58, with *f*/6.3 lens. Fluorescent light. Negatives to 2¼" x 3¼".

CAMERA GADGET BAGS

The most expensive bags are made of full-grain or top-grain leather, but the cheaper plastic bags will serve well enough when the luxury look of good leather is not important.

A. RECOMMENDED

Hinson 2652T (Hinson Mfg. Co., Waterloo, Iowa) $5.95. Made of *Hinsolon* (a vinyl plastic coated cloth). Size, 9½" x 8" x 3¼" with outside pocket, 7" x 4½" x 1". Materials, finish, construction, and workmanship judged satisfactory. 1

Sears (Sears-Roebuck's Cat. No. 3—8372) $4.50, plus postage. Plastic with cloth backing, brown welting. Size, 10½" x 7¼" x 3¼" with outside pocket, 8" x 4" x 1". Construction, finish, and workmanship, good. Outside appearance fairly good for a low-priced bag. 1

Kent B-22 (Sterling Howard Corp., 561 E. Tremont Ave., New York 57) $12. Made in Japan. Top-grain pigskin. Size, 8¼" x 10" x 4" with two outside pockets, one 5" x 2¾" x 1¼" and one 5" x 3½" x 1¼". Well-designed, of good construction and workmanship. 2

Tower, No. 8326 (Sears, Roebuck & Co.; made by J. B. Perrin Co.) $12, plus postage. Top-grain cowhide with dark brown plastic welting. Size, 8" x 6¼" x 3¼" with outside pocket, 6¼" x 3½" x 1". Materials, finish, construction, and workmanship judged very good. Available in three larger sizes at $15, $19.50, and $24. 2

Wards (Montgomery Ward's Cat. No. 67—3377; made by J. B. Perrin Co.) $12.95, plus postage. Top-grain saddle leather with plastic welting. Size, 10½" x 7¼" x 3¾" with outside pocket, 8½" x 4½" x 1¼". 2

MOTION PICTURE CAMERAS
and equipment

Bell & Howell and Revere now offer fully automatic movie cameras which set and change the exposure to suit the existing light conditions so that about all the operator has to do is frame the scene and push a button. In the 8 mm. cameras, light energy from the electric eye adjusts the stop. In the *Bell & Howell* 16 mm. camera, energy from six small batteries operates the controls. These cameras will be welcomed by many who have had difficulty in correctly exposing movie film. We would not recommend at this time that persons to whom expense is important should purchase such cameras containing complicated and delicate mechanisms which can easily get out of order and make repair costs high; it would be best for many amateurs to wait a while, until there has been more experience with the new equipment and the cost of repairing and adjusting it.

For most home movie fans, the choice between an 8 mm. and a 16 mm. camera will be based primarily on cost of operation. 16 mm. is about three times as expensive to operate per minute of showing as 8 mm. This great difference and the lower price of the 8 mm. cameras themselves account for the far greater popularity of the 8 mm. cameras.

Because of the small size of the 8 mm. frame as projected (0.17 x 0.13 inch), which is only about half as big in each dimension as 16 mm. film (0.38 x 0.28 inch), the quality of the pictures produced by 8 mm. equipment is definitely inferior to that obtainable from 16 mm. motion picture film. 8 mm. cameras weigh only about half as much as 16 mm. cameras and are much less bulky. Nevertheless, many users find 8 mm. quite satisfactory, particularly if they do not attempt to project to a large size. A 4-minute showing of 16 mm. color film will cost about $9 or $12 (roll or magazine, respectively) compared to $3.50 or $4 (roll or magazine) for 8 mm.

Cameras (16 mm.)

A. RECOMMENDED

Bell & Howell, Model 200 (Bell & Howell Co., Chicago) $200, with *f*/1.9 *Super Comat* lens of 1″ focal length in focusing mount. Magazine camera.

Bell & Howell, Model 200-T (Bell & Howell Co.) $245, with *f*/1.9 *Super Comat* lens of 1″ focal length in focusing mount. Magazine camera with 2-lens turret.

Bell & Howell, Model 70 (Bell & Howell Co.) This was the basic model of spool cameras. Prices, with one lens, runs from $361.50 up.

Bolex, Model H-16 (Paillard Products, Inc., 265 Madison Ave., New York 16) $270 and up, depending on lens and finder.

Cine-Kodak Royal Magazine 16 (Eastman Kodak Co., Rochester, N.Y.) $190, with *Kodak Cine Ektar* *f*/1.9 lens. Focusing model.

B. INTERMEDIATE

Keystone K-51 (Keystone Mfg. Co., Boston) $170, with *f*/1.9 lens in focusing mount. Magazine camera.

Revere 16 (Revere Camera Co., Chicago) $170, with *f*/2.5 lens; fixed focus. Magazine camera.

Cameras (8 mm.)

A. RECOMMENDED

Bell & Howell, Model 172-A (Bell & Howell Co., Chicago) $200, with *f*/1.9 *Super Comat* lens of 0.5″ focal length in focusing mount. Magazine camera with 2-lens turret. Additional lenses of focal lengths 1″, 1.5″, and 2″ available.

Bell & Howell, Model 172-B (Bell & Howell Co.) $135, with *f*/2.5 *Comat* lens of 0.5″ focal length. Fixed focus.

Bell & Howell, Model 134-W Companion (Bell & Howell Co.) $120, with *f*/1.9 *Super Comat* lens of 0.5″ focal length in focusing mount; $90, with *f*/2.5 fixed-focus lens.

Bell & Howell, Model 134-V Sportser (Bell & Howell Co.) $130, with *f*/1.9 *Super Comat* lens of 0.5″ focal length in focusing mount; $100 with *f*/2.5 fixed-focus lens.

Bolex C-8 (Paillard Products, Inc.) $90, with *Yvar* *f*/2.8 lens of 0.5″ focal length in fixed mount; *Model B-8* at $120 is similar but has lens turret.

Cine-Kodak Medallion 8 (Eastman) $145, with *f*/1.9 lens in focusing mount.

DeJur Citation DC-600 (DeJur-Amsco Corp., Long Island City, N.Y.) $78, with *Wollensak Raptar* coated *f*/2.5 lens in fixed-focus mount; $103, with *f*/1.9 lens in focusing mount.

Revere B-63 (Revere Camera Co.) $152, with *f*/2.5 lens; fixed-focus. Magazine camera with 3-lens turret; $178, with *f*/1.9 focusing lens.

Revere 80 (Revere Camera Co.) $97.50, with *f*/2.5 *Wollensak* lens; fixed focus; $122.50, with *f*/1.9 focusing lens.

* * *

The following are considered good buys at their prices.

Kodak Brownie (Eastman) $30, with *f*/2.7 lens; $37.50, with *f*/2.3 lens; $44.50, with *f*/1.9 lens; fixed focus; $79.50, with three *f*/1.9 lenses and turret.

Projectors (16 mm.)

A. RECOMMENDED

Bolex, Model 8-16 (Paillard Products, Inc.) $340, with case. Takes 8 mm. or 16 mm. film.

Filmo Diplomat (Bell & Howell) $300, with case. 750- or 1000-watt lamp.

Projectors (8 mm.)

A. RECOMMENDED

Bolex, Model 8-16.

Keystone K-95M (Keystone Mfg. Co.) $124.50, with case. *f*/1.6 lens. 750 watts.

Revere, Model 90 (Revere Camera Co.) $159.50, with case. 500 or 750 watts.

C. NOT RECOMMENDED

Keystone K-100 (Keystone Mfg. Co.) $100, with case. *f*/1.6 lens. 500 watts. This model is reported to have given troubles in operation.

MAIL-ORDER PHOTOFINISHING SERVICES

The choice of a photofinishing service can be very important for a person who wants good negatives and good prints. Careless work may charge 4 to 5, up to n). A fair proportion of the production photofinishing services re found to do a good job considering oderate prices charged.

Prices given are for developing and printing a No. 620 or 120 roll of film with 8 exposures, negative size 2¼ x 3¼ inches. In most cases, about 50 percent more is charged for a 12-exposure roll. Prints were on glossy paper, except one set returned from Edwards (see listing). Ratings are cr55.

A. RECOMMENDED

Tower Personalized Photo Service, P.O. Box 755, Chicago 42. 50c. Print size, 3" x 4½". Results were consistently good on several lots (more than a dozen rolls of film).

Eastman Kodak Stores, Inc., 20 E. 45, New York 17. 76c. Print size, 2⅛" x 3⅛".

Wardway Photo Service, Park Ridge, Ill. 60c. Print size, 3" x 4½".

r, 106 E. 41, New York 17. Custom

0 W. 32, New York 1. 85c. 2⅛"

B. INTERMEDIATE

Crown Photo Service, P. O. Box 392, Augusta, Ga. 40c. 3" x 4½".

Envoy Photo, Box 121, Bath Beach Station, Brooklyn 14, N.Y. 40c. 3" x 4½". Prints from one roll were definitely unsharp (though negatives were excellent).

DeLuxe Film Service, Shreveport, La. 35c. 3" x 4½".

Edwards Fine Grain Laboratory, Inc., Box XX, Chicago 90. $1.24. 2" x 3⅛". One roll was returned with semi-matte prints of very good quality, worthy of an *A-Recommended* rating.

Hagner Photo Service, 1318 W. Columbia Ave., Philadelphia 22. 40c. 3½" x 5¾".

Perfect Film Service, Box 668, La Crosse, Wis. 40c. 3½" x 5⅝".

Rhodus Photo Finishing Co., P. O. Box 388, Kansas City 41, Mo. 56c. 3" x 4½".

Western Photo Service, Box 298, San Francisco 1. 40c. 3" x 4½".

Important features for safety in and about the home

The following are some of 62 numbered requirements and 15 "optional requirements" to reduce the major sources of accidents in and around a home which were set up by the Home Builders Association of Greater Cleveland, the Greater Cleveland Safety Council, and The Cleveland Press:

- Terracing or gently sloped grading, if site is hilly.
- Three-foot overhang or awning at outside doors.
- Good lighting at front and rear steps and where ground levels change.
- Free view of driveways and streets (not obstructed by shrubs, trees, fences, or walls).
- Non-skid surfacing on walks and drives (rough, rather than smooth finish).
- Roofing material that resists sparks or radiant heat. If asphalt shingles are used, 250 pounds per square should be the minimum quality; 325 pounds per square is desirable to increase fire resistance.
- Good lighting throughout basement and on basement stairs.
- Basement walls painted in a light color.
- Basement steps painted in contrasting colors; steps light, dark risers, for better visibility.
- Three-foot minimum landings at top and bottom of stairs.
- Elimination of dangerous changes in floor level; minimum of three steps at any change in floor level.
- Grab bars for tub or shower stall [non-metallic, preferably, for electrical safety].
- Window sills at least 30 inches from floor on upstairs windows.
- Lock-up cabinet for household poisons.
- Locked storage compartment for guns, dangerous implements, etc.
- Floor seal, not varnish or shellac finish, on hardwood floors.
- Sliding kitchen cabinet doors, when over counter height.
- Locks on bedroom and bathroom doors, where used, which may be opened from either side, to prevent children from locking themselves in accidentally. It must be possible to open closet doors from inside the closets.
- Plumbing and heating work to meet requirements of National Plumbing Code, National Board of Underwriters, local codes, and manufacturers' specifications.

Bicycles, tricycles, strollers

BICYCLES

While the size of a bicycle is often given in terms of the outside diameter of its tires, a much better measure to use in selecting a machine to fit a given person is the *frame size*. This is the length of a straight line from the axle about which the pedals turn (the "hanger") to the top of the frame where the seat post is inserted —*not* to the top of the seat. To determine the correct frame size, subtract nine inches from the rider's inside leg measurement—crotch to heel. Saddle height and handle bar position are adjustable on all bicycles, making it possible to use a bike that is a little too small by the frame size rule just given. A bike that is too large is likely to be uncomfortable, hard to manage, and thus dangerous. For small children (beginners), pedal blocks may be used so that the feet may reach the pedals of a bike that would otherwise be too big, but there are risks sometimes connected with the use of the blocks.

Saddle height of a bike should be adjusted so that, when the rider is astride the seat, his toes, but not his heels, can touch the ground. Another test for saddle height is that the rider should be able to follow the pedals around with his heels without stretching. The handle bar height and tilt and saddle tilt are adjusted to suit individual preference.

Every bearing in a bicycle is adjustable. Each can be too tight and inhibit free motion, or too loose, causing sloppy fit and operation. The buyer who has any doubts about the adjustment of a new bike (new bikes are often not correctly adjusted) will find it well worth while to have it gone over throughout by a competent bicycle mechanic; a fair charge for such service (if nothing is found broken or out of order) would be from $3 to $5.

A bicycle requires regular maintenance. A good home mechanic can keep a bike in satisfactory condition with a little guidance from a person of experience or a detailed service manual.

There are two types of brakes in common use—coaster brakes and caliper-type rim brakes. The coaster brake is actuated by reverse pressure on the pedals. Rim brakes operate on both front and rear wheels and are actuated by levers mounted on the handle bars. The braking action of rim brakes is on the whole more satisfactory, and the mechanism is simple and less subject to breakdown and much easier to repair than that of a coaster brake. When rim brakes or the wheel rims are wet, however, a 1½ to 4 times greater stopping distance is required than when the brakes are dry; in some cases, coaster brakes are also susceptible to loss of effectiveness under wet conditions. A few bikes have both types of brakes, coaster on the rear wheel and caliper rim on the front. Children's bikes are usually equipped with coaster brakes.

Many foreign bicycles and some lightweight domestic machines of the "foreign type" have multiple speed gears — usually three speeds, "low," "normal," and "high." "Low" gear is a real help in climbing hills; on an average, the push required to propel a bike is about 30 percent less in low than in normal gear. "Gear" of a bicycle is a number roughly equivalent to the number of feet the bike is propelled by four complete revolutions of the pedals without any coasting. With a low "gear" there is relatively easy pedaling and slow speed; a high "gear" gives higher speed at the expense of harder pedaling. On three-speed gearshifts, the average normal gear is about 65, low around 45, and high 85.

The prices given in the listings are those paid by Consumers' Research—the lowest prices we could readily find at cut-rate sources in the New York area. These prices may bear little relation to what a consumer must pay in his own neighborhood—but they do show something of the *relative* prices likely to be encountered. (In judging them, take into account the extra equipment included, as indicated in each listing.)

Country of origin is given for all the listings; names of manufacturers and American distributors are given where known.

Model numbers were not marked on the bikes and hence are not given; names shown are those actually on the machines.

Ratings are cr58.

Bicycles with 26-inch wheels, for larger children and adults

A. RECOMMENDED

Bianchi Sport (Made in Italy; Edoardo Bianchi, Milan) $40. Man's, frame size 21 in. Weight, 36 lb. *Styria* hub, three speeds, gears 46, 60, 81. Rim brakes. The sharp ornament on the mudguard presents a needless hazard, but this could be removed by the purchaser. Equipped with lights, generator, pump, tool bag, kickstand. No tools.

Hercules (Made in England; Hercules Cycle & Motor Co., Ltd., Birmingham; replacement parts available from Hercules Div., The Cleveland Welding Co., 23 W. 23 St., New York 10) $47. Woman's, frame size 19½ in. Weight, 40 lb. *Hercules* hub, three speeds, gears, 48, 64, 85. Rim brakes. Equipped with lights, generator, pump, large tool bag, kickstand. Combination wrench, one oilcan.

J. C. Higgins (Made in Austria; U. S. distributor, Sears, Roebuck & Co., Cat. No. 1—4628) $43.88, plus shipping. Man's, frame size 21 in. Weight, 38 lb. *J. C. Higgins* hub (similar in appearance to the *Styria*), three speeds, gears 50, 66, 88. Rim brakes. Equipped with lights, generator, pump, tool bag, kickstand. No tools.

Raleigh (Made in England; Raleigh Industries, Ltd.) Similar to the *Rudge* listed below.

Rudge (Made in England; Raleigh Industries, Ltd., Nottingham; distributed by Raleigh Industries of America, Inc., 687 Boylston St., Boston) $46. Woman's, frame size 19½ in. Weight, 35 lb. *Sturmey Archer* hub, three speeds, gears 47, 65, 91. Rim brakes. Equipped with pump and large tool bag. Three special wrenches. ¶The *Humber*, made by the same manufacturer, is a similar bicycle.

B. INTERMEDIATE

Automoto (Made in France; distributed by Andrew Fisher Cycle Co., Inc., 240 Madison Ave., New York 16) $45. Man's, frame size 21 in. Weight, 38 lb. *Sturmey Archer* hub, three speeds, gears 49, 66, 88. Rim brakes for front wheel; coaster brake for rear wheel. Equipped with pump, tool bag, rear luggage rack, lights, and generator. Two wrenches (not sufficient for all needed adjustments), three tire irons, and a set of patches for tire tubes.

Rollfast Deluxe (Made in U.S.; D. P. Harris Hardware & Mfg. Co., 99 Chambers St., N.Y.C.) $43. Woman's, frame size 18 in. Weight, 44 lb. Single speed, gear 63. *Perry* (English) coaster brake. Equipped with headlight, electric horn, kickstand, rear luggage rack, and "tank." No tools.

* * *

Bismarck (Made in Germany) $33. Man's, frame size 18 in. Weight, 38 lb. Single speed, gear 63. *Perry* coaster brake. Equipped with kickstand, luggage rack over rear wheel. Details of welding, construction, and finish considered somewhat below average. One wrench for coaster brake; no tools for other parts requiring adjustments.

Bicycles with 20-inch wheels, for small children

A. RECOMMENDED

Hercules Royal Prince (Made in England; Hercules Cycle & Motor Co., Ltd.) $32. Girl's, frame size 16 in. Weight, 26 lb. Single speed, gear 40. *Perry* coaster brake. Equipped with tool bag and rear luggage rack.

B. INTERMEDIATE

Metasco Jet (Made in Western Germany) $25. Boy's, frame size 13½ in. Weight, 28 lb. Single speed, gear 44. *Komet* coaster brake. Equipped with removable "training wheels." Frame welding considered somewhat below average.

Rollfast (Made in U.S.; D. P. Harris Hardware & Mfg. Co.) $29.75. Boy's, frame size 15 in. Weight, 30 lb. Single speed, gear 44. *Perry* coaster brake. Equipped with kickstand.

* * *

Huffy Mainliner (Made in U.S.; Huffman Mfg. Co., Dayton 1, Ohio) $39. Girl's, frame size 13 in. Weight, 41 lb. Single speed, gear 36. *New Departure* coaster brake. Equipped with headlight, "tank," rear luggage rack, removable "training wheels." The solid rubber tires gave a rough, uncomfortable ride (other bikes in the test had air-filled tires). The *Huffy* was the second heaviest machine of those tested, including the 26-inchers, and was much too heavy for a young child.

▶ **REF:** Bulletin, April '58.+++

TRICYCLES

In choosing a tricycle, consider its probable useful life. If younger brothers and sisters will eventually use the tricycle, it will pay to buy the best you can afford. For one child's use only, perhaps a lower-priced model with fewer constructional advantages will serve. In any event, avoid any tricycle with unnecessary sharp edges and projections. Look for a maximum of desirable features at the price asked. Some of these features are wishbone frame, a large number of spokes per wheel, replaceable pedals, smooth, well-finished welds, and, if your pocketbook permits, ball bearings.

Many manufacturers do not set list prices on their tricycles. The prices shown in the listings are those paid by CR at various department stores, toy stores, and discount houses.

Ratings are cr57.

A. RECOMMENDED

Evans Imperial, Model 252 (Evans Products Co., Plymouth, Mich.) $19 (at a discount house). 12-in. front wheel, 16 adjustable spokes; wishbone frame, 1¼- and 1-in. tubing. Ball bearings throughout. Replaceable pedals; clamp-type handle bar (desirable). Weight, 21¼ lb. Leatherette saddle, adjustable height and tilt. Sharp edges on front fender. Judged sturdy, very well constructed. Did not tip readily.

Happi Time (Sears-Roebuck's Cat. No. 8584) $14.84, plus shipping charges. 13-in. front wheel, 24 spokes; 1¼-in. wishbone frame. Nylon bearings on front and rear wheels. Permanently attached pedals; welded handle bar. Weight, 21¼ lb. Leatherette saddle, adjustable for height only. Sharp edges on front fender. Judged sturdy, well constructed. Stability, about average.

Midwest (Midwest Industries, Willard, Ohio) $13.95. 10-in. front wheel, 12 spokes; 1¼-in. wishbone frame. Ball bearings on front wheel only. Permanently attached pedals; welded handle bar. Weight, 17¾ lb. Leatherette saddle, adjustable for height only. Sharp edges on rear platform. Judged sturdy and well made. Did not tip readily.

Murray 440 (Murray Ohio Mfg. Co., Cleveland) $19.75 (at a discount house). 12-in. front wheel, 16 spokes; wishbone frame, 1¼- and 1-in. tubing. Ball bearings on front and rear wheels. Permanently attached pedals; welded handle bar. Weight, 20¼ lb. Leatherette saddle, adjustable for height only. Sharp edges at bottom of front fender, which is pointed, and on edges of rear platform. Judged sturdy and fairly well made. Stability, about average.

B. INTERMEDIATE

A.M.F. Junior (Junior Toy Corp.) $8.03 (at a discount house). 13-in. front wheel, 12 spokes; T-frame, 1¼-in. main bar. Ball bearings on front wheel only. Permanently attached pedals; welded handle bar. Weight, 13¾ lb. Metal saddle, adjustable for height only. Judged a fairly good, lightly constructed tricycle. Tipped readily.

A.M.F. Junior Trike, Model G 661 (Junior Toy Corp., Hammond, Ind.) $13.45 (at a discount house). 12-in. front wheel, 12 spokes; T-frame with 2- and 1¼-in. bars. Ball bearings on front wheel only. Permanently attached pedals; 3-piece welded handle bar. Weight, 19¼ lb. Leatherette saddle, adjustable for height and tilt. Front fender had sharp projection, and rear platform had sharp edge. Fairly well constructed otherwise. Did not tip readily.

Siebert Warrior (O. W. Siebert Co., Gardner, Mass.) $10.95. 10-in. front wheel, 12 spokes; T-frame with 1¼-in. main bar. Ball bearings on front wheel only. Permanently attached pedals; welded handle bar. Weight, 17¼ lb. Leatherette saddle, adjustable for height and tilt. Sharp edges on front fender. Judged a fairly good, lightly constructed tricycle. Did not tip readily.

Stelber, Model C12 (Stelson Mfg. Corp., Brooklyn 16, N. Y.) $14.95. 12-in. front wheel, 12 spokes; 1¼-in. wishbone frame. Ball bearings on front wheel only. Permanently attached pedals; welded handle bar. Weight, 19¾ lb. Leatherette saddle adjustable for height only. Sharp edges on front fender and rear platform. Judged a fairly well constructed tricycle. Did not tip readily.

C. NOT RECOMMENDED

Pal Superbike (Laporte Corp., Laporte, Ind.) $9.95. Construction judged below average. Tipped readily.

▶ **REF:** Bulletin, Dec. ’57.+++

BABY STROLLERS

A baby stroller should be stable, so that the child cannot tip it over even when he leans out of it. The seat should be located so that the weight of the child is well between the wheels, and any built-in shopping bag or basket should be so located that when filled it does not increase greatly the tendency of the stroller to tip. All of the *A*-rated strollers had good stability.

There should be a firm vertical or very nearly vertical back rest which reaches at least up to the mid-point of the child's back. The distance from the footrest to the seat should be adjustable.

Two of the strollers tested, the *Strolee* and the *Teeterbabe,* had no brake at all. The brake on each of the others operated on the right rear wheel only. With swivel-type front wheels, this arrangement leaves the stroller free to pivot around the fixed wheel; the result could be an upset, with possible serious injury to the child.

Ratings are cr57.

A. RECOMMENDED

Baby-Mate (Baby-Mate, a subsidiary of Siegler Corp., Los Angeles 58) $19.95. Relatively heavy; 21 lb. Back adjustable, three positions; flat footrest adjustable, two levels. Folds to fairly small size.

Collier, No. 5648 (Collier Keyworth Co., Gardner, Mass.) $22.95. Heaviest stroller tested; 25 lb. Back adjustable to three positions, footrest to two. Bulky when folded.

Folda-Kart by Grow-Rite (Sharco Mfg. Corp., Mt. Vernon, N.Y.) $12.98. Moderately heavy; 17 lb. Back adjustable to four positions, footrest to two. Quite bulky when folded.

Storkline Sleeper Stroller 516 (Storkline Furniture Corp., Chicago 23) $16.95. Relatively heavy; 21 lb. Back adjustable to three positions, footrest to two. Hard to fold, and is fairly large when folded.

Thayer L-78 (Thayer Inc., Gardner, Mass.) $16.95. Relatively heavy; 23 lb. Back adjustable to four positions, footrest to two. Has step. Bulky when folded.

B. INTERMEDIATE

Siebert, Commuters Special, No. 5605 (O. W. Siebert Co., Gardner, Mass.) $14.95. Moderately heavy; 16 lb. Neither back nor footrest is adjustable. Moderately bulky when folded. Stability, fair, but with a 10-lb. load in the shopping bag stability is poor.

Strolee Matic, No. 102 (Strolee of California, Los Angeles 3) $16.95. Relatively light; weight, 13 lb. Neither back nor footrest is adjustable. Stability, good.

Taylor-Tot P-85 (The Frank F. Taylor Co., Cincinnati 12) $18.95. Moderately heavy; 15 lb. Back adjustable to two positions, footrest not adjustable. Bulky when folded. Stability, fair.

C. NOT RECOMMENDED

Folda Rola, Model F-11 (A. E. Peterson Mfg. Co., Glendale 1, Calif.) $16.95.

Hedstrom Scotch Shopper, No. 8603 (Hedstrom-Union Co., Fitchburg, Mass.) $10.95.

Teeterbabe, Model 100 (National Production Co., Detroit 14) $14.90.

Welsh Easy-Fold (Welsh Co., St. Louis 4) $14.95.

▶ **REF:** Bulletin, Apr. ’57.+++

Polishing materials

For automobiles • floors • furniture • silver • copper and brass • shoes

AUTOMOBILE POLISHES AND PROTECTIVE COATINGS

In general, there are three types of products sold for maintaining the appearance of an automobile. They are cleaners, polishes, and protective coatings. There are also combination products which polish *and* leave a protective coating.

A discussion of these three types with ratings of polishes and some cleaner-polishes and protective coatings appears in the July '58 Bulletin.

PRODUCTS FOR "DRY WIPING" OF CARS

C. NOT RECOMMENDED

Conniver (Madison House, 40 Fargo St., Boston 10)

Kozak Auto Dry Wash (Kozak, Inc., Batavia, N.Y.)

FLOOR WAXES

A recent study indicates that, contrary to general belief, waxing floor covering materials, such as vinyl, linoleum, asphalt tile, does not retard wear except on linoleum and to a lesser extent on cork. Keeping floors waxed, however, helps keep up their appearance. Using the right type of wax, e.g., one which is self polishing or one which requires buffing if circumstances require, is important. On floor coverings made of rubber or asphalt, a self-polishing wax should be used. This type of wax does not contain a solvent harmful to rubber or asphalt. Wood floors should be sealed first and then kept waxed with a wax of the kind that requires polishing.

Self-polishing (sometimes called water-base) wax dries with a degree of gloss which can be improved by buffing. Some self-polishing floor waxes contain a high percentage of shellac and are subject to loss of gloss by contact with water. Piling one coat on top of another tends to give an unwanted color to the surface, and the application of too many coats makes later removal of the wax more difficult.

Flooring materials for which each type of wax is suitable

Waxes for polishing (contain a solvent) used on:	Self-polishing waxes (water-emulsion) used on:
inlaid linoleum	inlaid linoleum
enameled-surface	enameled-surface
vinyl, sheet or tile, with or without backing	vinyl, sheet or tile, with or without backing
cork*	asphalt tile
wood*	rubber tile
	concrete†
	marble†
	terrazzo†

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* Before waxing, this flooring should be sealed with a penetrating floor sealer to prevent staining and wear.

† Self-polishing wax is satisfactory. If mechanical means of polishing are available, use the other type (polishing wax) applied very thinly and buffed thoroughly.

Wax to be polished (sometimes called a solvent-base wax) is sold in both liquid and paste forms. Either kind requires buffing to produce a gloss. The wax should be applied in the thinnest coat possible, in one direction only. For a higher gloss and a less slippery surface, buff the floor after the wax has dried. (There are many accidents due to slipping of scatter rugs or of shoe soles or heels on floors and floor coverings coated with a slippery film of wax.)

Proper waxing of floors reduces the amount of care they require.

Mopping with a dry dust mop, and occasionally with a damp mop between waxings, is all that is needed for daily cleaning. Do not use an oil-treated mop on a waxed floor.

An asterisk (*) at the end of one of the following listings means that the product is combustible. Ratings are cr54.

Self-polishing waxes

A. RECOMMENDED

Bright Sail Hard Sheen (Distributed by The Great A & P Tea Co., N.Y.C.) 1 qt., 53c.

Johnson's Hard Gloss Glo-Coat (S. C. Johnson & Son, Inc., Racine, Wis.) 1 pt., 59c.

Simoniz Non-Scuff (Simoniz Co., Chicago 16) 1 qt., 85c.

Wilbert's No-Rub Non-Scuff (Wilbert Products Co., Inc., N.Y.C.) 1 pt., 45c.

B. INTERMEDIATE

Aerowax No Rubbing (Boyle-Midway, Inc., Cranford, N.J.) 1 qt., 47c.

Beacon Quik-Gloss (The Beacon Co., Boston) 1 qt., $1.10.

C. NOT RECOMMENDED

Bruce (E. L. Bruce Co., Memphis, Tenn.) 1 qt., $1.09.

Wards Best Quality (Montgomery Ward's Cat. No. 86B2) 1 qt., 79c, plus postage.

Liquid waxes that require polishing

A. RECOMMENDED

Johnson's Beautiflor (S. C. Johnson & Son, Inc.) 1 qt., $1.35.*

Old English (Boyle-Midway, Inc., Jersey City 2, N.J.) 1 qt., 89c.*

Preen (The A. S. Harrison Co., South Norwalk, Conn.) 1 qt., $1.19.*

Wilbert's Twins (Wilbert Products Co., Inc.) 1 pt., 45c.*

Paste waxes that require polishing

A. RECOMMENDED

Johnson's (S. C. Johnson & Son, Inc.) 1 lb., 64c.*

Wilbert's (Wilbert Products Co., Inc.) 1 lb., 45c.*

▶ **REF:** Bulletin, Sept. '54.+++

FURNITURE POLISHES AND WAXES

The consumer can choose from four basic kinds of furniture polish—cream, oil, those containing silicone, and paste. Each has certain advantages and disadvantages.

Cream polishes require rubbing to produce a gloss and an application does not last as long as with the silicone polishes, but cream polishes cost about half as much.

Oil polishes are the least expensive and are easy to apply, but the finish does not last as long as that with a cream polish. Further, oil polishes leave an oily, dust-catching, easy-to-smear finish.

Silicone polishes are easy to wipe on and off and require relatively little buffing. They leave a hard, shiny, smooth surface that does not hold dirt, and does repel water. Since the coating they produce is hazy before buffing, they are not practical for carved furniture.

Paste waxes, for protecting varnish and lacquer finishes and plain wood, are the hardest to apply but last the longest. A polishing-type wax should be used on furniture (rather than a water-base type).

Oily and waxy rags should be disposed of out-of-doors where they could not set a fire; if they must be kept, store them only in a tightly covered metal can reserved for that use. An asterisk (*) at the end of a listing means that the product is combustible. Ratings are cr52.

A. RECOMMENDED

Dri-Glo (O-Cedar Corp., Chicago) 10-oz. bottle, 92c. Contained silicone. Retention of initial gloss, very good.*

Johnson's Cream Wax (S. C. Johnson & Son, Inc., Racine, Wis.) 1-pt. bottle, 69c.*

Old English Cream Wax (Boyle-Midway, Inc., Cranford, N.J.) 6-oz. bottle, 25c.

Pride (S. C. Johnson & Son, Inc.) 10⅓-oz. bottle, 92c. Contained silicone. Considered easiest of group to buff up. Best in ability of polished surface to withstand marring.*

Woodbrite (Boyle-Midway, Inc.) 8-oz. bottle, 79c. Contained silicone. Retention of initial gloss, very good.*

B. INTERMEDIATE

Gold Seal Wood Cream (Gold Seal Co., Bismark, N.D.) 16-oz. can, 59c.

Johnson's Paste Wax (S. C. Johnson & Son, Inc.) 1-lb. can, 69c. Retention of initial gloss, very good.*

Maid of Honor Cream Wax (Sears-Roebuck's Cat. No. 11—6480) 1-pt. bottle, 35c, plus postage.

Maid of Honor Oil (Sears-Roebuck's Cat. No. 11—6461) 1-qt. bottle, 35c, plus postage.

Preen (The A. S. Harrison Co., South Norwalk, Conn.) 1-pt. can, 64c. A liquid wax. Retention of initial gloss, very good.*

Radiant Lemon Oil (Boyle-Midway, Inc.) 8-oz. bottle, 15c.*

Wards Paste Wax (Montgomery Ward's Cat. No. 86—11) 1-lb. can, 39c, plus postage. Retention of initial gloss, very good.*

C. NOT RECOMMENDED

O-Cedar All Purpose (O-Cedar Corp.) 4-oz. bottle, 30c. An oil polish.

Old English Red Oil (Boyle-Midway, Inc.) ½-pt. bottle, 15c.*

Wards Oil (Montgomery Ward's Cat. No. 86—53) 1-qt. can, 29c, plus postage.

Wilbert's Furniture (Wilbert Products Co., Inc., New York 54) 12-oz. can, 17c.

Wilbert's No-Rub (Wilbert Products Co., Inc.) 8-oz. bottle, 27c.

▶ **REF:** Bulletin, Sept. '52.+++

SILVER POLISHES AND CLEANERS

Silver which is exposed to the air will become tarnished in time, the accumulation depending on the amount of sulfide gas existing in the air. The tarnish can be removed as often as it becomes necessary by: polishing with an abrasive, cleaning by chemical action, or cleaning by the electrolytic method.

Abrasive polishes. An abrasive polish should remove the tarnish and shine the silver without scratching it and it should remove a minimum of the silver, particularly on Sheffield and plated ware. A satisfactory abrasive for such a polish is diatomite (diatomaceous earth), provided it is free from impurities such as feldspar and quartz.

Chemical cleaners. A chemical cleaner removes tarnish by chemical action but does not polish the metal. Occasional polishing with an abrasive polish will be necessary to restore the luster. Silver pieces which have the ornamental French gray or black "antiquing" should not be cleaned with any of the chemical cleaners, because the chemical action removes the "antiquing."

Caution: All chemical cleaners should be handled with extreme care and under well ventilated conditions; they should be kept out of reach of children at all times. A silver dip or tarnish remover containing the extremely poisonous sodium or potassium cyanide should never be used in the home, or in any restaurant or hotel.

Ratings are cr54, unless otherwise noted.

Abrasive polishes

A. RECOMMENDED

Polishes listed under *A. Recommended* contained diatomite—some coarser than others—but all were sufficiently fine textured that they were considered satisfactory for cleaning and polishing silver.

Baker's Instantaneous (C. P. Baker & Co., 503-505 N. 11, Philadelphia) 10-oz. jar, 60c. Paste.

duPont (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.) 8-oz. bottle, 98c. Liquid.

Electro Silicon Cream (Electro Silicon Sales Co., Brooklyn, N.Y.) 1-lb. jar, 49c. Paste.

Gorham (The Gorham Co., Providence, R. I.) 8-oz. jar, 23c. Paste.

International (The International Silver Co., Meriden, Conn.) 16-oz. bottle, $1. Liquid.

JNT (J.N.T. Mfg. Co., Inc., N.Y.C.) 8-fl.-oz. can, 59c. Liquid.

Welmaid (Welmaid Mfg. Corp., Chicago) 8-fl.-oz. bottle, 50c. Liquid.

Wright's Cream (J. A. Wright & Co., Keene, N.H.) 8-oz. jar, 22c. Cream.

* * *

The abrasive used in the following two liquid silver polishes was found to be slightly harsher than that used in the products listed above; they are, therefore, considered less desirable.

Magic Silver and Pewter (The Magic Polish Co., Inc., N.Y.C.) 1-pt. can, 55c.

Noxon (Noxon, Inc., Jersey City, N.J.) 8-fl.-oz. bottle, 23c.

C. NOT RECOMMENDED

Silver Snow (Welmaid Mfg. Corp.) 2-oz. pasteboard container, 25c. Powder. Contained a mixture of thin fragments of volcanic glass and other mineral matter with diatomite.

▶ **REF:** BULLETIN, Feb. '54.+++

Chemical cleaners

B. INTERMEDIATE

Brite Silver (Copper Brite, Inc., 1109 Poinsettia Pl., Los Angeles 46) 8-oz. bottle, 89c. Liquid. "Double-action" cleaner-polish. Contained thiourea and an abrasive.

Instant-Dip (Lewal Industries, Inc., 150 E. 35, New York 16) $1 for 8 fl. oz. Liquid. Contained 7% thiourea. cr52

C. NOT RECOMMENDED

Lemcke's Dip-n-Rinse (Bellaire Products, Inc., Houston, Tex.; distributed by Roy R. Whitlock, 1902 Ruth, Houston 4, Tex.) $1 for 12 fl. oz. Contained cyanide; lacked proper poison labeling. cr52

Nu-Plate Silver Cream (Nordicson Enterprises, Ltd., Toronto, Canada) $1.95 a tube. Contained cyanide; lacked proper poison labeling. cr52

ELECTROLYTIC CLEANING OF SILVER

Tarnish can be removed from silver pieces satisfactorily and quickly by the electrolytic method. The method requires placing the pieces to be cleaned in an enamelware pan or tray containing hot water to which has been added one of the following: a level teaspoonful of baking soda, trisodium phosphate, or tetrasodium pyrophosphate, or 2 teaspoonfuls of ordinary table salt, for each quart of water, plus a piece of bright aluminum or aluminum foil, zinc, or tin. The temperature should be just below boiling, and the silver placed in the pan so that each piece touches the metal or another piece of silver which is in contact with it. To avoid the appearance of black spots, which must be removed with the use of an abrasive, the silver should not be left in the solution beyond the time necessary for the removal of the tarnish. Silver cleaned by the electrolytic method should be rinsed thoroughly with hot water after the treatment to remove all the salts used in the cleaning bath, otherwise it will tarnish more rapidly than usual.

Occasional polishing with a mild abrasive polish will be necessary to restore the luster. Silver pieces which have the ornamental French gray or black antiquing should not be cleaned by electrolysis. Pieces made of parts that are held together or weighted by cement, such as hollow handles or pearl handles, require special care to avoid softening the cement, which will occur if the tarnish-removing solution is too hot. The same precautions apply to such items as cream pitchers, which often contain a filler or weighting material within the hollow base.

Stainless-steel and silver pieces should not touch for long periods in an electrolytic bath; if they do, the steel is likely to become corroded.

A. RECOMMENDED

Magic Leaf (Paul-Reed, Inc., Charlevoix, Mich.) $1.25. Leaf-shaped piece of magnesium alloy. Removed tarnish satisfactorily when used in water considered just warm to the hand to which a powdered synthetic detergent had been added, as it would be in the washing of dishes. The "leaf" requires cleaning with scouring powder occasionally to remain fully effective. Was not nearly so effective when used with the liquid-type dishwashing synthetic detergents as when used with powdered syndets such as *Breeze, Surf, Tide,* or *Vel.* Should not be used to clean silver finished with French gray or black antiquing. cr53 2

▶ **REF:** Bulletin, July '53.+

PLATING COMPOUNDS

If they work at all, compounds sold for replating silver, nickel, chromium, etc., will deposit only an extremely thin and non-durable film. In the long run, it will be best to have needed plating done by a commercial plater.

Not only do plating compounds do a poor job of plating but some may contain poisonous cyanide. *Such products should never be used in a home, restaurant, lunchroom, or hotel.*

Ratings are cr51, except as noted.

C. NOT RECOMMENDED

Met-L-Cote and Silv-R-Cote Brush Plating. Kit, consisting of one 2-oz. bottle of plating solution and *Appl-i-coter* for applying the solution (brush, holder for 2 "penlight" dry cells, connecting wire and clip) sells for about $4. *Met-L-Cote* solution intended for chrome, nickel, or similarly plated articles; *Silv-R-Cote* for silver-plated articles. cr54

Miracle Instant Silver Plater. 8-oz. bottle, $3.

Nu-Silver. 3-oz. bottle, $1.

Quadruple Silvaplate "non-hazardous Formula D." 4-oz. bottle, $4. Did not contain the cyanide present in a previous sample of *Silvaplate,* included below.

* * *

The following four, on analysis, were found to contain cyanide.

Liquid Silver. 4-oz. bottle, $1.40. Contained cyanide (1.2%), without proper poison labeling.

Nu-plate Silver Cream. $1.95 a tube. Analysis showed 0.8% potassium cyanide; product lacked proper poison label. cr52

Quadruple Silvaplate. 4-oz. bottle, $4. Contained 1.1% sodium cyanide. cr50

Silver Swift. 4-oz. bottle, $2.70. Sodium cyanide, 1.3%.

CLEANERS FOR COPPER AND BRASS

Accumulations of tarnish can be readily removed from copper and brass articles with special cleaners available in powder, liquid, or stick form. Articles so cleaned should always be washed with a detergent in hot water and rinsed well before being used for serving foods. The abrasives used in polishes sold for cleaning copper and brass are too coarse for use on silver. The user should wear household gloves to protect the hands, when using a polish that is strongly acid (low pH).

Ratings are cr53.

A. RECOMMENDED

Samae Miracle Cleaner (Copper Clad Products Inc., Newark, N.J.) 12-oz. bottle, 69c. A white powder. pH of 1% solution, 3.1. Found convenient to use, and degree of acidity satisfactorily low.

Cop-R-stik (Embree Mfg. Co., Elizabeth 4, N.J.) 3-oz. stick, 49c. A stick of light brown color. pH of water extract, 1.4, corresponding to high acidity. Found somewhat inconvenient to use as directed, but gave copper a fine, smooth polish.

B. INTERMEDIATE

Copper Brite (Copper Brite, Inc., Los Angeles) 8-fl.-oz. bottle, 89c. A white powder suspended in liquid. pH, 0.05; strongly acid. Was convenient to use, and judged faster in action than the other two cleaners tested.

▶ **REF:** Bulletin, Feb. '53.++

TARNISH PREVENTIVES

Sterling or plated silver pieces which are to be displayed in the air can be protected for a time by applying a lacquer or equivalent thin transparent film. When the pieces require cleaning and recoating, the film will have to be removed, a somewhat difficult and time-consuming job. Lacquer and lacquer-like materials and solvents are extremely flammable, and the vapors are likely to be poisonous if breathed to any considerable extent. Any such work should preferably be done out of doors.

Silver pieces exposed to the air can also be protected by applying a tarnish-preventive paste, which can be removed readily at any time by washing in soap and water.

Pieces which can be put away are best protected from becoming tarnished by storing them in tarnishproof chests or wraps.

A. RECOMMENDED

Pacific Silver Cloth (Pacific Mills, Cotton & Rayon Div., 1407 Broadway, New York 18) $2.50 per yd., plus postage; and from 25c to $5.75, according to size, capacity, and type of bag, roll, or wrap. Protects against tarnish. Sold at various jewelers, department stores, and mail-order houses. cr53

Silvern (The Merchants Chemical Co. of Elm Court, Stamford, Conn.) $1.25 for 4-oz. bottle. A coating material to be painted on with a brush. Offered protection against tarnishing for some months. Should not be used for tableware or on utensils for food. Flammable. cr52

X-pose (Center Chemical Corp., 411 Hanna Bldg., Cleveland 15) $1.49, for kit which includes a silver polish (an abrasive suspended in a liquid), a tarnish-preventive paste, and a cloth for wiping. The cloth is flannel, impregnated with a mixture of about equal parts of wax and mineral oil. The paste is not recommended for use on tableware or other pieces to be used for foods, unless each piece is washed thoroughly before use. cr56

▶ **REF:** Bulletin, Sept. '52+, Oct. '53+, Jan. '56+.

SHOE POLISHES AND DRESSINGS

White shoe dressings

Pastes and creams do a better job of whitening but the liquids are easier to use. Liquids, however, cost more per application than the pastes or creams. All the shoe dressings tested rubbed off to some extent, but some were much worse in this respect than others. Ratings are cr53.

A. RECOMMENDED

Energine Shoe White Cream (The Cummer Co., Div. Sterling Drug Inc., Brattleboro, Mass.) 21c, 3 oz., cream.

Esquire Lanol-White (Knomark Mfg. Co., Inc., 330 Wyth Ave., Brooklyn, N.Y.) 25c, 3⅛ fl. oz., liquid.

Griffin Allwite (Griffin Mfg. Co., Inc., 410 Willoughby Ave., Brooklyn, N.Y.) 15c, 2 fl. oz., liquid. Judged one of the three best in hiding power.

Griffin Allwite (Griffin Mfg. Co., Inc.) 15c, 1½ oz., cream.

Shinola White (The Best Foods, Inc., 1 E. 43, N.Y.C.) 15c, 2½ fl. oz., liquid.

White Ace (Old Dutch Industrial Products Co., Inc., Harrison, N.J.) 25c, 3½ fl. oz., liquid. One of the three best in hiding power.

B. INTERMEDIATE

Elkay White Shoe Polish (Distributed by Rexall Drug Co.) 25c, 6 fl. oz., liquid.

Energine Shoe White (The Cummer Co.) 21c, 5 fl. oz., liquid.

Hollywood Sani-White (Hollywood Shoe Polish Inc., 105-78 Van Wyck Blvd., Richmond Hill 19, N.Y.) 30c, 3 fl. oz., liquid. One of the three best in hiding power.

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Considered less desirable than three preceding.

Carbona Shoe Whitener (Carbona Products Co., 30-50 Greenpoint Ave., Long Island City 1, N.Y.) 15c, 2 fl. oz., liquid.

Wilbert's No-rub (Wilbert Products Co., Inc., 805 E. 139, N.Y.C.) 11c, 2 fl. oz., liquid.

C. NOT RECOMMENDED

Cinderella, Carbona Shoe Whitener (cream), Elkay's White Shoe Soap, Quintone Scuffy, Shinola White (paste).

Shoe polishes

Liquid polishes have good covering properties, but paste shoe polishes give the best shine. The liquid shines are effective for covering scuff marks, particularly for shoes of young children. With the aerosol-applied polishes, it is difficult to confine the spray of polish to the shoes and avoid spraying furniture or clothing that happens to be in the vicinity.

Paste polishes consist principally of waxes, solvents, oil, and dye. Stain polishes contain a relatively high percentage of dyes.

Ratings are cr54.

Paste polishes, black

A. RECOMMENDED

Bon Ton Boot Stain (Whittemore Bros. Corp., Cambridge, Mass.) 25c for 2 fl. oz.

Esquire Boot Stain (Knomark Mfg. Co., Brooklyn, N.Y.) 25c for 1½ oz.

Griffin Boot Stain (Griffin Mfg. Co., Inc., Brooklyn, N.Y.) 25c for 1½ oz.

Kiwi Boot Stain (Kiwi Polish Co., Pty. Ltd., England) 25c for 1⅓ oz.

Lady Esquire Duplex Cream (Knomark Mfg. Co.) 25c.

Shinola 2-in-1 Wax (The Best Foods, Inc., N.Y.C.) 11c for 1½ oz.

Shinola Wax (The Best Foods, Inc.) 15c for 1½ oz.

Wilbert's (The Wilbert Products Co., Inc., N.Y.C.) 10c for 2½ fl. oz.

B. INTERMEDIATE

Cadet Oil (Whittemore Bros. Corp.) 15c for 3½ fl. oz.

Griffin ABC Wax (Griffin Mfg. Co., Inc.) 15c for 1½ oz.

New Era (Whittemore Bros. Corp.) 25c for 3¼ fl. oz.

Whittemore Wax (Whittemore Bros. Corp.) 10c for 1½ oz.

Paste polishes, brown

A. RECOMMENDED

Bon Ton Boot Stain (Whittemore Bros. Corp.) 25c for 2 fl. oz.

Griffin ABC Wax (Griffin Mfg. Co., Inc.) 15c for 1½ oz.

Griffin Boot Stain (Griffin Mfg. Co., Inc.) 25c for 1½ oz.

Kiwi Boot Stain (Kiwi Polish Co., Pty. Ltd.) 25c for 1½ oz.

New Era (Whittemore Bros. Corp.) 25c for 3¼ fl. oz.

Shinola 2-in-1 Wax (The Best Foods, Inc.) 11c for 1½ oz.

Whittemore Wax (Whittemore Bros. Corp.) 10c for 1½ oz.

B. INTERMEDIATE

Cadet Wax (Whittemore Bros. Corp.) 15c for 2½ fl. oz.

Esquire Boot Stain (Knomark Mfg. Co.) 25c for 1½ oz.

Paste polishes, oxblood

A. RECOMMENDED

Bon Ton Boot Stain (Whittemore Bros. Corp.) 25c for 2 fl. oz.

Esquire Boot Stain (Knomark Mfg. Co.) 25c for 1½ oz.

Kiwi Boot Stain (Kiwi Polish Co., Pty. Ltd.) 25c for 1½ oz.

Kiwi Boot Mahogany Stain (Kiwi Polish Co., Pty. Ltd.) 25c for 1½ oz.

New Era (Whittemore Bros. Corp.) 25c for 3¼ fl. oz.

Shinola Wax (The Best Foods, Inc.) 15c for 1½ oz.

B. INTERMEDIATE

Cadet Wax (Whittemore Bros. Corp.) 15c for 2⅓ fl. oz.

Shinola 2-in-1 Wax (The Best Foods, Inc.) 11c for 1½ oz.

Whittemore Wax (Whittemore Bros. Corp.) 10c for 1¾ fl. oz.

Liquid polishes, black

A. RECOMMENDED

Esquire Scuff-Kote (Knomark Mfg. Co.) 25c for 2¼ fl. oz.

Griffin Wax (Griffin Mfg. Co., Inc.) 15c for 2 fl. oz.

Quintone Scuffy (K. J. Quinn & Co., Inc., Malden, Mass.) 25c for 2¼ fl. oz.

B. INTERMEDIATE

Cadet Wax (Whittemore Bros. Corp.) 15c for 2 fl. oz.

Shinola Wax (The Best Foods, Inc.) 11c for 2½ fl. oz.

Liquid polishes, brown

A. RECOMMENDED

Esquire Scuff-Kote (Knomark Mfg. Co.) 25c for 2¼ fl. oz.

B. INTERMEDIATE

Cadet Wax (Whittemore Bros. Corp.) 15c for 2 fl. oz.

Griffin Wax (Griffin Mfg. Co., Inc.) 15c for 2 fl. oz.

Shinola Wax (The Best Foods, Inc.) 11c for 2½ fl. oz.

Liquid polishes, oxblood

A. RECOMMENDED

Shinola Wax (The Best Foods, Inc.) 15c for 2½ fl. oz.

Whittemore Scuff (Whittemore Bros. Corp.) 25c for 2¼ fl. oz.

B. INTERMEDIATE

Cadet Wax (Whittemore Bros. Corp.) 15c for 2 fl. oz.

Griffin Wax (Griffin Mfg. Co., Inc.) 15c for 2 fl. oz.

Don't polish or wax your automobile too soon

Car paint should not be polished or waxed until it has hardened properly; for new cars with a lacquer finish, wait at least 30 days; with an enamel surface, wait at least three months. If in doubt about the finish, check with a dealer of the make of car in question; generally, however, General Motors' cars have lacquer, all others have enamel. To avoid scratching the finish, do not "dry wash" or wipe a car with a dry fabric or sponge of any kind.

Safety in the home

Electric shock • electrical fire hazards • hazards in the use of gas • other home hazards fire extinguishers • precautions needed in home repairs • accidental poisoning

ANY mechanical, electrical, or gas-operated appliance can present a serious and unsuspected hazard if the design or the workmanship is poor or if the user is careless in working with it, or does not maintain it in good and proper operating condition. With household chemical products, such as rust removers, cleaning solvents, silver polishes, and many others, there may be hazards that would be avoided by a different choice of ingredients, by better labeling, and by "built-in" safety provisions of various sorts. Thus, the reasonable safety in use of products is a major consideration in CR's evaluations.

ELECTRIC SHOCK

Essentially, electricity is carried in two (sometimes three) insulated wires which connect to each electrical appliance in your home. If the insulation on the wiring becomes thin, cracked, worn, or otherwise defective so that it no longer keeps the electricity completely within its path in the wire, some of the electricity may escape, or "leak" to parts of the appliance where it is not expected or supposed to be. If the appliance is a major one, for example, a range or washer, and is properly grounded through a connection between its frame and other metal parts to a cold-water pipe, it is still relatively safe, with a small amount of leakage current, because the electric current which leaks through faulty or deteriorated insulation into the wrong path (called leakage current) is by-passed to the earth through the ground connection.

If a ground connection is not present or is poorly made, a very dangerous condition may present itself. Under either condition, if a person touches the frame or any metallic part of an electrically defective appliance and is at the same time touching or standing on a "grounded" object (a water faucet, radiator, heating pipe, a damp or wet floor, are examples), a return path for the leaking electrical current is completed *through that person's body*. This briefly explains one way in which a person may be killed by touching a poorly designed or defective electrical appliance.

Consumers' Research determines the degree of shock hazard in each electric appliance it tests by measuring the *electrical leakage or stray current*. Most appliances are also subjected to a proof-voltage (overvoltage) test. The proof-voltage test subjects the electrical insulation in the appliance deliberately to an abnormally high voltage to determine its ability to withstand the occasional momentary excess voltages that it is subjected to from time to time in use. It also shows up any weaknesses in the electrical insulation which might be the source of a hazard at some later period when heat and time and use have caused deterioration of parts and wiring.

Many people will find that leakage currents of 0.2 to 1 milliampere will give a tingling sensation and be most annoying; the sudden, unexpected sensation may startle one and thereby cause an accident. (One milliampere is about 1/250 of the current that flows in the filament of an ordinary small flashlight bulb.) Leakage currents greater than 1 milliampere are judged excessive because the sensation of shock becomes severe and, depending upon the amount of current flowing, can cause a person to react involuntarily by jerking his hand or arm away from the point of contact. Such a reaction may result in spillage of boiling water, wrenching of a muscle, falling from a ladder, or other incidents capable of causing serious injury. If the current flowing through a person's hand or arm is greater than about 5 milliamperes, he may be rendered incapable of letting go of the live object, wire, or part. When this occurs, the results may be serious or even fatal. Currents in excess of 5 milliamperes are therefore potentially dangerous.

A current only three or four times as large, only 15 to 20 milliamperes, passing from hand to hand through the chest may cause death by asphyxia through contraction of the diaphragm muscles.

Currents above 70 milliamperes are usually fatal if the current path is through the heart.

The severity of the shock one receives is dependent principally upon the resistance of the leakage circuit. A low voltage does not in itself assure safety; even two volts can cause a perceptible sensation of shock (though most unlikely to cause injury or death).

If, at any time, you experience even a slight shock from an electrical appliance, take it out of service immediately and have it repaired. Don't take a chance on a "next time."

Anything electrical, such as a lamp, radio, or TV set, that is ungrounded and used near water, pipes, heat registers, a damp floor, particularly of earth or concrete, can present a dangerous situation. With perspiration and dampness of body, clothing, and shoes or bare feet the hazard is greatly increased. Any work area where electrical appliances are used should be kept as free from moisture and dampness as possible, and one should be especially careful in locations where dampness cannot be avoided, as in a kitchen, bathroom, patio, or a basement laundry. If liquid is spilled in such an area see that it is mopped up immediately, before any electrical equipment is operated. No ungrounded electrical appliance should be used near a kitchen sink or washbasin, or in a bathroom, or in a garage or on a patio, either unfloored or with a brick, tile, concrete, or flagstone floor or any floor made of other materials capable of absorbing moisture. Electric shavers of well-known brands may be used if in first-class condition.

Appliances, such as electric lawn mowers, hedge clippers, trimmers, which are always used out-of-doors, should be treated with due respect. Most are safe electrically; however, any can become most dangerous if misused or allowed to fall into disrepair. With such appliances, it is a good safety measure, particularly if your lawn or hedge is wet, as it would be after a rain, to wear a pair of rubber overshoes and dry leather gloves. Any such tool should be equipped with rubber or plastic handles, and you should never allow a child to operate such an appliance.

An appliance that is plugged in can present a hazard whether its switch is turned on or off. It is wise to "unplug" any appliance not in use, particularly where children are about. Many lives would have been saved if this had been the regular practice of appliance users. Babies have been electrocuted in sinks where they were being bathed, by merely grasping or pulling a toaster or a plugged-in extension cord into the water or onto a wet surface of the drainboard. Many a death has occurred when an electric heater or radio fell into the tub in which a person was bathing.

Ground connections are usually made to metal water pipes, and permanently-installed electric appliances and tools should be "grounded" in this way. Be sure there is a "jumper" wire around your water meter, if one is present, to insure a continuous circuit to ground in case the meter is removed for repair or adjustment.

On a farm or in a home where a local water supply with electric pump is used, a ground wire should be connected between the piping near the pump and a driven pipe ground. (A well *casing* is satisfactory, but the suction pipe from the pump down the well pipe into the water will very likely *not* be a good ground.)

Some further suggestions regarding safe use of electricity in the home:

1. No light switch or pull chain should be near a bathtub; preferably bathroom lights should be switched on or off from a point outside the bathroom door.
2. Never use a portable heater in a bathroom, laundry, or garage.
3. Don't use metal towel racks or grip bars at the tub.
4. Every pull chain should contain an insulating link of fiber or porcelain (available in electrical supply stores). A non-metallic cord, such as string or twine, is preferable to metal.
5. The dangers of fatal shock are especially great with all appliances and all power tools used *out of doors.*
6. Don't buy any electrical appliance which does not carry the name and address of its manufacturer. Don't buy a private-brand appliance or one made by a firm that has gone out of business or does not have a good reputation for financial soundness and responsibility.

The relatively new three-bladed plugs now used on many portable tools and appliances are satisfactory and provide maximum safety if one can be sure that the ground connection does carry back to a good electrical ground. It is not safe practice to use special adapter plugs which enable one to use a three-bladed plug in a two-slot outlet. If you are not certain that your home is wired properly for ground connection at receptacles, you will be well advised to have the whole system checked by a competent electrician. The solid, workmanlike grounding of equipment, such as portable drills, portable saws, washing machines, ironers, and other laundry apparatus commonly used in moist locations, is especially important. For the sake of safety, it is best to use No. 14 or larger wire for grounding. A No. 8 or 10 ground wire should be used on permanently-installed appliances operating on 230 volts. (An exception should be made for toasters, bowl-type electric heaters, and other appliances which have an exposed heating element that can be or may be accidentally touched by the user while it is plugged in. These should not be grounded.)

The Underwriter's Laboratories' label or the symbol *UL* on an electrical item or appliance indicates that specimens of the article have passed certain specifications with regard to electrical shock and fire hazards, and it is an important and necessary though somewhat limited safeguard to life and property. The *UL* label does not imply quality or other aspects of utility or performance of an appliance, nor does it provide assurance that the leakage current will be below a safe level. No electrical accessory or appliance should be purchased unless it has the *UL* label on the appliance itself. A label on the cord is not enough!

The reader should refer also to the following items listed in other sections of this *Annual* for additional discussions on shock hazard: portable electric water-heating devices, television receivers, portable power tools.

ELECTRICAL FIRE HAZARDS

The following rules should help to reduce the fire hazards often attributable to the misuse of electricity and electrical appliances.

1. Never overfuse. Overloaded and improperly fused circuits are frequent causes of fires. Because branch circuits are fused for either 15 or 20 amperes (usually 15), substitution of higher-rated fuses (or a coin behind a burned fuse) can lead to trouble, often to disaster. If in doubt, consult an electrician—*don't* take a chance.

2. Inspect periodically and repair or replace as needed all open wiring such as extension cords, cords and plugs on appliances, lamps, heaters, and anything else in the house which "plugs in."

3. Don't run extension cords in any areas where they may be stepped on, and do not run them through a doorway, under a door, or beneath a rug or carpet. It is best to have an electrician install wall receptacles where needed.

4. Curtains, draperies, towels, shower curtains, and the like should never be hung near any electrical (or gas) heating device (including a toaster) or range. A breeze or draft may bring them in contact with hot elements or heated surfaces and start a fire.

5. Every attic fan should have a thermostatic switch installed in the air stream on the suction side, to cut off the fan if there is a fire in the home.

6. Possible danger in electric blankets and heating pads is indicated by the presence of hot spots and intermittent heating. Useful life is shortened with rough or careless use. Do not have an electric blanket dry cleaned and do not put it away with moth balls or flakes or other moth-control chemicals. Blankets are designed to be placed *over, not under,* the sleeper. Electric blankets poorly designed, or deteriorated in use have caused many fires.

HAZARDS IN THE USE OF GAS

Gas, whether for cooking, heating, or refrigeration, should be used very carefully. Leaky connections, burners turned on accidentally but not lighted, or accidentally blown out by the wind, and lack of proper ventilation coupled with incomplete burning of gas are the principal causes of gas fires or accidental gas poisoning. There is a good likelihood that any gas appliance which has been in use for some time is in need of adjustment or repair. Any slight odor of gas, poor burner action, or imperfect combustion (sometimes indicated by soot formation or unusual appearance of the flame) may indicate existence of a serious hazard. Safety requires that any gas appliance be permanently connected with rigid pipe, made up with the proper jointing material for the type of gas in question, rather than with any sort of flexible or jointed tubing. Various portable gas heating and cooking appliances are often used in small closed rooms where they quickly exhaust the oxygen from the air and replace it with poisonous gases. There are many asphyxiations and lethal poisonings from this cause. From the safety standpoint, it is best to vent *all* gas appliances to the outdoors, particularly those which have automatic controls to turn the burners on or off, such as water heaters, or leave a window open part way in every room where an appliance is in use (including a gas refrigerator). A gas oven or a water heater should not be used for heating a room.

If you suspect a gas leak, do not operate a light switch or anything electrical or light a match. A flame or spark, even from a flashlight switch, may ignite the gas, if present. Use a soap solution to locate the leak.

If you use LP (bottled) gas for cooking or heating, the storage tank should be outdoors, never inside a building or in its basement. This gas is heavier than air and if the tank or connections leak, the leaking gas tends to collect at low levels such as cellars, window wells, etc., where it may readily be exploded with terrific force or cause a fire.

FIRE AND OTHER HAZARDS

Home fires are the cause of more than 4000 deaths annually and literally thousands of people are burned severely or die from their injuries. The principal causes of building fires in the U. S. in 1956 were (1) careless use of matches and smoking; (2) defective or overheated heating and cooking equipment; (3) electrical fires due to defective or improperly used equipment and overloaded circuits; (4) rubbish; (5) lightning; and (6) flammable liquids such as kerosene, grease, tar, etc.

Fires can be started by appliances, through malfunctioning of certain parts and because of lack of routine maintenance. Great care should be taken not to leave unwatched such items as heating pads, portable electric heaters, washers, dryers, sun lamps, fans, etc., that are connected and turned on. *Never* use an electric or gas dryer for drying articles of foam rubber, or fabrics or garments that have just been dry cleaned, or treated with a solvent. The lint screen and vent pipe must be cleaned frequently.

Kerosene stoves and portable oil heaters, whose use is prohibited by many city ordinances and regulations, have been the direct cause of many fires in which whole families have been wiped out while they slept. They are inherently dangerous appliances, especially where there are old people or children about. If one must be used: (1) never carry it when lighted; (2) keep the fuel supply outdoors and refill the heater there; (3) place the heater at a good distance from any combustibles such as curtains, furniture, and walls. If you must have the heater burning after retiring, keep a window or door open slightly to provide an adequate oxygen supply.

Do not store in the house any explosive or flammable liquids such as gasoline, benzine, benzene, and naphtha. It is best that no homemaker should use any type of dry-cleaning fluid, except for small grease spots or something of that sort, and in that case the work should be done out of doors. Carbon tetrachloride and related chemical substances are extremely popular for use as spotting agents or grease removers (also in rubber cement and quick-drying lacquers) because of their non-flammability but they, particularly "carbon tet," are active, dangerous poisons, harmful by inhalation and on the skin and exceedingly dangerous if ingested, as they occasionally are, by a young child (see CONSUMER BULLETIN, July 1956).

Rags smeared with or saturated with oil or paint should be disposed of promptly outdoors or kept in a tightly covered metal container. If you don't, they may heat up spontaneously by chemical action and burst into flames. Never hang paint- or oil-soiled clothing in a clothes closet. It should be out of doors and in a place where air can circulate around it freely.

Many major fires destroying homes and woodlands start in piles of rubbish left around or outside but close to the house, or from sparks from burning rubbish, grass, or leaves.

FIRE EXTINGUISHERS
and alarm systems

The National Fire Protection Association Standards recognize three general classes of fires:

Class A fires, which occur in ordinary combustible materials such as wood, cloth, and paper, where the combined quenching and cooling effect of quantities of water is most effective in reducing the temperature of the burning material below its ignition temperature.

Class B fires, which involve flammable petroleum products or other flammable liquids, greases, etc., where the best extinguishing medium to use is one which deprives the fire of the oxygen it needs to continue burning.

Class C fires involve electrical equipment. With these it is of primary importance that the extinguishing medium be a non-conductor of electricity.

Because much confusion exists about the choice of extinguisher for a particular type of fire (some extinguishers can be used on two types, but no one type is good on all three), Consumers' Research feels that for home use only three should be considered: the water-under-pressure extinguisher for Class A fires; and the carbon dioxide and dry chemical types which are suitable for Class B and Class C fires.

Before you buy any extinguisher, make sure it carries a *UL* label. On the label of an extinguisher that was made recently you will find a number and a letter. The *number* is indicative of the approximate *fire extinguishing potential* of the appliance on a particular type of fire (the larger the number the greater the potential). The *letter* refers to the *class of fire* on which the extinguisher can be used. (No number is used with Class C since such fires are essentially Class A or Class B fires involving energized electrical equipment.)

Having chosen an *approved fire extinguisher* of suitable type, the consumer may purchase safely on a price basis. Never buy a used or reconditioned extinguisher, or an extinguisher of any type on the basis of any sort of *demonstration* or salesmen's claims.

Avoid use of vaporizing liquid extinguishers; these are inherently dangerous because of the poisonous nature of the liquids commonly used and their fumes. One should not buy or install any sort of grenade or bulb extinguisher that is supposed to put out fires automatically. Such a device is almost certain to contain carbon tetrachloride or chlorobromomethane, both of which produce highly toxic fumes and gases. *The bulb or grenade is not an effective fire extinguisher.*

If you purchase a complex or expensive home fire alarm system, it, too, should have passed the *UL* test requirements.

You will be well advised to be suspicious of any door-to-door selling scheme related to fire protection, especially regarding home fire alarm systems as well as any in which solicitation is made by telephone, unless the seller is known to you. Misleading and tricky sales tactics are very common in this field, and many homemakers have ordered fire protection equipment obligating themselves for very large sums which they had not intended to contract for.

DO IT YOURSELF?

It is best to hire a trained and experienced man to do any important repair work when possible. When you do, be sure to protect yourself financially by *making sure that he carries adequate insurance coverage* for your protection in the event of an accident to him or one of his men, during the course of the work. *He should be asked to show evidence of his being properly covered.* If he is not covered, you will need to carry workmen's compensation insurance of your own.

It is a wise precaution to have all the power tools in your shop connected so that the branch circuit or circuits they are plugged into can be turned off by one switch. That switch should be *locked,* or in a location inaccessible to a child. If you use a portable power tool, such as a drill, saw, hedge clipper, electric mower, be sure a ground wire is connected between the frame of the tool and a good ground (e.g., a water pipe, not a drain pipe or spout). Many portable tools now come equipped with a three-wire connecting cord (type S cord is satisfactory) and a 3-blade plug (two blades for carrying electricity, one for a ground connection). If you use an extension cord with any such tool, that cord too should be three-wire, *correctly wired,* with the third (ground) wire, usually green, connected to a good ground. See also page 95.

ACCIDENTAL POISONING

Many thousands of children (and many grown-ups, too) are poisoned each year because they accidentally swallow or come into contact with one of the many toxic substances found in today's homes. More than a thousand deaths occurred in 1956 from this cause. Among the thousands of products which may contain dangerous chemicals are medicines, bleaching solutions, floor cleaners and waxes, furniture polishes, kerosene, cleaning solvents, paint removers, deodorants and deodorant sprays, detergents, ammonia, disinfectants, rug cleaners, metal polishes, moth balls and mothproofing preparations, weed killers, insect repellents, poisons for insects and vermin (the use of insecticidal vaporizers has been virtually banned in one state and their use should be restricted everywhere by law).

Don't assume that a product is harmless because the label does not carry a prominent poison warning and a list of included poisonous ingredients with suggestions for an antidote. (Common aspirin is the leading cause of poisoning of young children, and the unsuspected contamination of milk and butter with residues of pesticides such as DDT continues to increase yearly.)

The Food and Drug Administration in its leaflet, Protecting Your Family Against Poisoning, free from the Food and Drug Administration, Washington 25, D. C., suggests: (1) Don't allow food or food utensils to become contaminated when using insect sprays, aerosol mists, rat poisons, weed killers, or cleaning agents. (2) Don't take or give medicine in the dark. Be sure you can clearly read the label. (3) Date all drug supplies when you buy them. (4) Don't store poisonous or flammable substances in food or beverage containers.

Cosmetics and toilet supplies

THE ERA OF extravagant nonsense is showing signs of returning, particularly in television advertising of cosmetics. Those who remember the '30s when turtle oil was widely featured in cosmetic creams, until somebody pointed out publicly that the turtle was wrinkled and ugly, will recognize the similarity in the present campaign to promote Royal Jelly as having some undefined but magical cosmetic effect.

It is generally recognized that there is no such thing as "skin food," but there are current attempts to promote various substances, including lanolin derivatives, vitamins, estrogen hormone in creams and lotions, and Royal Jelly with something akin to the ad-men's extravaganzas of earlier days. Actually, the most effective way of caring for the skin is to keep it clean, usually with any one of a number of good toilet soaps and water (substituting a synthetic bar soap such as *Dove* in cases of allergy to soap), applying a good lanolin cream or lotion as an emollient to keep the skin soft and flexible.

There is no possibility that wrinkle eradicators and deep-pore cleansers can fulfill their implied promises nor is there anything known to science that will restore the original color to hair that has turned grey or that will cure early male baldness.

The present Food, Drug, and Cosmetic Act empowering food and drug officials to take action against cosmetics hazardous to health that are sold in interstate commerce is fairly effective in enabling them to keep dangerous products off the market or to remove such items once they have appeared. Most of the hazards today are to the pocketbook, and the thrifty-minded person will do well to bear in mind that in these days of extensive exchange of knowledge in the chemical field there are no really rare, precious, exclusive secret essential ingredients except in advertising. It is not necessary to pay a high price to secure a product of good quality. Excellent cosmetics will be found in the five-and-dime variety chain stores.

COSMETIC DERMATITIS

About one out of every ten American women is reported to be allergic to some cosmetic ingredient. The substance which causes the difficulty may be quite common and entirely safe for most people. There are few, if any, primary irritants to which the majority of users react unfavorably in any cosmetic, but there are a number of sensitizing agents to which a few people react unfavorably. No cosmetic can actually be completely non-allergenic to all users, but there are several firms which specialize in making hypo-allergic cosmetics in which agents likely to be sensitizing are kept to a minimum. The best known brands of this type are *Ar-Ex*, *Allercreame*, *Luzier's*, *Marcelle*, *Almay*, and *Beauty Counselors*.

The most frequent cases of allergic dermatitis appear to have been due to the use of deodorants, depilatories, hair tonics and pomades, lipsticks and nail polishes. The most effective treatment of such a dermatitis is to discard the offending cosmetic. Occasionally wet compresses, calamine lotion, or a bland ointment may be prescribed by a physician for relief from itching or discomfort. As a rule, simply avoiding contact with the offending substance will remedy the difficulty.

MAKE-UP

Lipstick is considered one of the most essential cosmetics. Since the individual dyes and pigments used must all be certified by the Food and Drug Administration, there is little danger that a lipstick that is put out by a nationally known manufacturer will be toxic or seriously irritating. The chief difficulty with present lipsticks, particularly the so-called indelible type, is that they are drying to the lips. Some women have an allergy to lipstick, usually attributable to the dyes. The only cure is to give up the use of lipstick entirely, although it is sometimes possible on a trial-and-error basis to find a brand, particularly among the hypo-allergenic brands, that is fairly tolerable. Perfume oils, thin oils used as solvents, and the large amounts of staining dyes in indelible-type lipsticks, as well as the particular color used, are all held to be possible factors in causing dryness of the lips.

Nail lacquer is quite effective in covering the unsightly results of too-frequent contact with detergents and water, and the wear and tear of daily household chores, but it also is a cause of brittle, dry and cracked nails and cuticle in some cases. There have been some reports that taking daily a tablespoonful of plain gelatine dissolved in fruit juice or some other liquid may help to strengthen brittle nails, but this technique has not been effective in all cases. Fingernail formation appears to be influenced by a number of factors, including the individual's state of nutrition and certain disease conditions.

In 1957, artificial fingernails in the form of colored plastic strips to be applied over the natural nails achieved a spectacular success through effective television advertising. The product known as *TenDay Press-On Nail Polish* was the subject of a warning by the Food and Drug Administration in February 1958 that some 700 women had complained to the manufacturer and the Food and Drug Administration of disfiguring and sometimes painful injury to their nails after use of the product. For the most part the injuries were slight, but in some cases the nails broke off to the quick. There was no indication of permanent injuries and the nails apparently grew back normally after the use of the product was discontinued.

Eyebrow and eyelash darkeners. Cosmetics used around the eyes must be made from chemicals that will not cause irritation or endanger the sight if they inadvertently get into the eye. The present Food, Drug, and Cosmetic Act forbids the sale of coal-tar dyes for use on the eyelashes and eyebrows. One large cosmetic firm is currently working for an amendment to permit certain coal-tar colors in eye shadow preparations. At present, the only permitted dyes for lashes and eyebrows are dilute solutions of silver nitrate to be developed with sodium thiosulfate. Mascara, either in cake or liquid form, is essentially a colored pigment in soap. Eyebrow pencils are pigments incorporated in wax crayons. Care should be taken to make certain that none of these preparations gets into the eyes.

CARE OF THE HAIR

Shampoos. Any good toilet soap may be used to shampoo the hair, although it is preferably applied in liquid form by dissolving finely shaved soap in hot water. More popular, however, are the liquid shampoos which have as their principal ingredient one or more synthetic detergents. Such shampoos may be used effectively in hard water, and with these it is not necessary to use an acid rinse to remove curds or residues. Since synthetic detergents do such a thorough job of cleansing that the removal of natural oil makes the scalp and hair dry, various additives are included in a well-formulated shampoo to leave the hair softer, more lustrous, and easier to manage.

About all that can be truthfully claimed for a shampoo is that it gets the hair and scalp clean and leaves the hair manageable. These simple characteristics of an effective shampoo do not allow much scope for the advertising man's imagination, hence the introduction and promotion of some unique ingredient in a particular product such as egg, lanolin, bacteriostats such as pine tar, colloidal sulphur, hexachlorophene, along with various conditioners that counteract the drying effect of the synthetic detergent. The Food and Drug Administration has taken the position that any product designated as egg shampoo must contain one egg or the equivalent amount of whole dried egg in the quantity that would be used in one shampooing of the hair. Eggs in earlier days were used as a kind of conditioner to avoid the effects of the harsh alkalies of poor soap. There is very little, if any, need for their use today.

Dry shampoos in the form of powder consisting of starch, talc, fuller's earth, corn meal and similar substances are only superficially effective in removing grease and oil and it is difficult to remove the powder entirely by vigorous brushing. Liquid dry shampoos are better known in Europe than the United States and consist of common dry-cleaning fluids such as benzine and carbon tetrachloride that should never be used on the skin or scalp because of the harmful effects of inhalation of the vapors and absorption through the skin.

Rinses. Acid rinses such as two tablespoonsful of lemon juice or one tablespoon of vinegar to a pint of warm water were used at one time to remove the scum or curd formed by the action of soap in hard water. With modern shampoos based on the use of synthetic detergents, a rinse is no longer necessary, although some proprietary rinses based on the use of acetic, citric, malic, tartaric acids, or combinations of acids are available.

Cream rinses are dilute solutions of fatty acids combined, for example, with condensate of aminoethyldiethanolamine. They are essentially dilute solutions of "reconditioning shampoos" and are designed to counteract the defatting effect of synthetic shampoos and help to make the hair soft and easy to manage. The quaternary ammonium salts are also used in cream rinses. Whether or not they are worth the extra time and money involved is a matter for the individual to determine for herself.

Permanent waves may be given the hair by one of three methods: machine, machineless, or cold wave. The most popular technique is the cold-wave type, which is based on the use of a thioglycolate solution that softens the hair wound on curlers to give it shape. The softening action is stopped by the application of a neutralizer such as potassium bromate, although some of the new techniques require the application of only one solution and omit the second process. The one-solution method uses a weak solution of ammonium thioglycolate and relies on exposure to the air for oxidation to stop the process while the hair is still on curlers.

The tightness of the curls is determined by the strength of the waving lotion and the length of time it is left on the hair. Users of home-wave kits should be careful to keep the solutions out of reach of children for they are quite poisonous if taken internally. Except for allergic reactions to thioglycolate, they are considered to be relatively safe for use on the hair.

Hair dyes and rinses. Hair dyes for home use are usually based on solutions of silver that produce a jet black color when applied. Metallic dyes, including lead as well as silver, deposit a kind of plating on the hair which may develop into an unattractive off-shade and eventually make the hair stiff and brittle. It is difficult to give a permanent wave to hair that has been dyed by a metallic compound. Since the results of all dyes of this type are inartistic, to say the least, the percentage of metallic dyes is estimated at about 2 percent of the hair dyes sold. All metallic dyes sold in New York City must carry a caution on the label that they contain "ingredients which may cause skin irritation on certain individuals and should be used with care."

The most effective dyes are those based on use of paraphenylenediamine or paratoluylenediamine. The "para" type dyes give a more realistic effect and last until the hair to which they are applied grows out. If they are expertly applied after a patch test has been made to determine whether the user is allergic to them, there may be no ill effects. Such hair dyes are required to carry a warning label and instructions for making a "patch test" before use. They are available for home use as well as beauty shop application.

Many hair tints or "colorants" are currently being advertised. Most of them are coal-tar ("para") dyes in various degrees of concentration. The term "tint" is often applied to dyes that last for four to six washings. A "rinse" put on when the hair is shampooed may last until the next shampoo. The temporary rinses usually contain citric acid and a small amount of coal-tar dye. When sold for home use, they may be recognized by the charactertistic warning required on the label of all coal-tar ("para") dyes.

Hair sprays. Preparations which hold the hair in place and give it a glossy sheen are available in wide varieties for both men and women. Brilliantine is usually mineral oil combined with castor oil. Solid brilliantine may be petrolatum combined with a paraffin base wax or some other wax to give the product body.

More popular for women have been the spray type based on the use of alcohol and a propellent such as *Freon* with PVP (polyvinylpyrrolidone). Some 50 hair sprays, including *Arden's Blue Grass* hair spray, Helene Curtis' *Super Soft Spray Net,* and *Charles Antell Hair Spray,* Daggett and Ramsdell's *Sparkling Gold,* have been based on this type of formula. The PVP spray does not make the hair quite so stiff as lacquer and it is easily removed by brushing or washing. It is important in using this spray to make certain that none of it is inhaled. Two cases of lung infiltration attributed to frequent use of a PVP spray were reported in 1958. Both cleared up when use of the spray was discontinued, but the substance may be dangerous, for it is known to have caused malignancy in laboratory animals.

Hair tonics and dressings. Preparations for "restoring" hair to a bald head have been hopefully used for centuries. There are always customers for them in spite of the widely disseminated views of competent medical men and scientists that there is no cure, effective treatment, or remedy known to science for the ordinary case of male baldness. Each year brings some new advertising angle.

Currently promoters of these products and treatments refer to themselves as "trichologists," although the Federal Trade Commission's files are full of cases which indicate that, as a rule, promoters making such claims have not under-gone competent training in dermatology or any other branch of medicine having to do with the diagnosis or treatment of scalp disorders affecting the hair.

The customary technique is to run an advertisement in the leading newspaper of a particular city inviting people to consult with the representative of the particular product being offered by making an appointment at his local office (usually a hotel room) for diagnosis and advice on hair and scalp care, which, of course, includes the merchandise being promoted.

Common dandruff of the scalp is a characteristic condition of civilized living and is seldom due to disease conditions. Usually a weekly shampoo will be the most economical and effective method of dealing with it. Tonics for treating dandruff are commonly alcohol and water, sometimes with the addition of antiseptics, antibiotics, or scalp irritants that give a tingling sensation and encourage the user in the belief that something is being achieved by their application.

Hair dressings are available in wide variety. They are sometimes perfumed alcohol and water, an emulsion of oil in water, alcohol with a small amount of oil, oil combined with a wax or petrolatum, and the so-called cream dressings which are oil in water emulsions somewhat similar to hand lotions. There is also an aerosol spray based on the use of PVP, for men *(Stag Perfect Hair Groom)*, similar to the hair sprays for women.

DEODORANTS AND ANTI-PERSPIRANTS

Deodorants are designed to prevent perspiration from developing an unpleasant odor. Since they do not effect the bodily processes, they are not required by the Food, Drug, and Cosmetic Act to indicate on the label their essential ingredients. Commonly used are boric, benzoic, salicylic acids, zinc oxide, magnesium carbonate, talc, and hydroxyquinoline sulfate, and hexachlorophene. Antibiotic creams are also sold for the purpose, but are considered undesirable since some people react unpleasantly to the use of antibiotics. Convenient to apply are the hexachlorophene sticks, of which there are a number on the market, including *Jergens, Tussy,* and *April Showers.* Washing the armpits or other parts of the body with a hexachlorophene soap such as *Dial* has been found effective in keeping perspiration odor in check.

Anti-perspirants are designed to prevent perspiration from appearing on that part of the skin to which they are applied. The most effective ingredient for such preparations is an aluminum compound, such as aluminum chloride or aluminum chlorhydroxide. One of the earliest and simplest anti-perspirants was a 16 to 20 percent solution of aluminum chloride in water. This preparation, however, is irritating to many people and it is usually destructive to textiles that come in contact with the skin to which it is applied.

In order to mitigate the irritation from the liquid type of aluminum chloride preparations, buffering substances have been used, in combination with an aluminum compound, which have taken many forms as creams, lotions, and sprays. One new formula combined zirconium oxychloride with aluminum chlorhydroxide. Although the combination both in cream and in stick form was found to be effective in reducing perspiration, there are reports of unfavorable allergic reaction due to its use. The irritation manifested itself as little granulomas or nodules on the skin which disappeared when the use of the deodorant stick was discontinued.

It is usually possible to determine whether a particular anti-perspirant contains zirconium by reading the label carefully before making a purchase.

REMOVAL OF SUPERFLUOUS HAIR

Shaving is the quick and convenient method of removing superfluous hair. A safety razor with a good blade (see listings) or an electric shaver are the most effective tools.

Chemical depilatories are effective but somewhat messy to apply and remove when used on large areas such as the legs. They are also considerably more expensive than shaving. Most modern chemical depilatories contain calcium thioglycolate as their essential ingredient which softens the hair and causes it to disintegrate so that it may be scraped off with a wooden applicator or washed off with water. There are a number of brands based on the use of this ingredient including *Imra, Nair, Pellex, Sleek, X-Bazin,* and *Zip Cream Hair Remover.* They are considered safe for use on the legs and arms but should not be used on the face, particularly near the eyes. Since the chemical ingredient must be declared on the label, it is simple enough to determine whether a particular product contains calcium thioglycolate by reading the label carefully.

Wax preparations, sometimes referred to as jellies, that are designed to be applied in liquid form, allowed to harden, and then yanked off taking the hair with the wax, are somewhat painful to use and inconvenient to apply. Hair thus removed will, of course, grow back in time. Abrasives and pumice disks are sometimes used to wear off the hair when it is fine, but the removal process is rather slow and in some cases it may be irritating.

Electrolysis in the hands of a competent operator is the only safe method of removing hair permanently. It is, however, expensive and sometimes a small percentage of the hairs treated will return. The use of home electrolysis is likely to be unsatisfactory because a high degree of skill is required for best results. In the hands of an unskilled person, there is also some danger of scarring from improper application of the needle.

X-ray treatment for hair removal is dangerous and may result in serious disfiguration.

CREAMS AND LOTIONS

The practice of oiling the skin in order to keep it moist, smooth, and supple is centuries old. Before creams are used, however, it is always essential to make certain that the skin is cleansed, preferably by the use of soap and water. As a rule, cleansing creams contain varying amounts of mineral oil that may have a drying effect on the skin and that are incapable of removing all kinds of dirt.

The most effective lubricant is one that contains lanolin, the substance that most nearly resembles the sebum normally found in the skin which keeps it flexible. Recent studies have disclosed that overdry skin needs moisture as well as oils to regain the normal, smooth, moist state. To achieve this condition, there are two techniques: one is the use of silicone creams or lotions that are designed to act as a barrier to prevent defatting of the skin; the other is the use of a lanolin derivative that not only acts as a lubricant but releases moisture from a properly formulated lotion making it available to the skin.

The silicone creams are used in treating rough heels and ankles to prevent the cracked skin from snagging nylons. They may also be applied before doing such jobs as washing dishes, handling wet clothes, dusting, painting, and gardening to protect the skin from hot water, detergents, grime, and grease.

Hand creams and lotions are essentially the same as those used on the face. In addition to silicone preparations that women apply before immersing the hands in water, and lubricant lotions or creams containing lanolin, there is the translucent type, that is a mixture of tragacanth, glycerol, and water, such as *Italian Balm.* This type of lotion gives temporary relief from dryness of the skin and is useful for a quick application.

Washing the hands, applying lanolin cream or lotion, and putting on a pair of clean, cotton gloves while doing household and garden chores or overnight will speed the restoration of moisture and smoothness.

Suntan lotions and creams. Extensive exposure of the human body to the sun involves serious dangers to health. Damage to the skin may include hyperpigmentation, precancerous dermatosis, and even skin cancer. In any event, since the body's first line of defense against the sun's rays is a thickening action, the skin in time may develop a dry, leathery aspect that is quite unattractive. There are a number of products currently available that incorporate in creams and lotions chemicals that are effective in screening out most of the ultraviolet rays of the sun that burn. These rays that produce sunburn are chiefly in the wave length of the solar spectrum between 2950 and 3150 Angstrom units. Sunscreen preparations if properly formulated should enable the user to remain in the sun long enough to secure an eventual tan without severe burn. They will not, however, enable the person who burns but never tans to spend an afternoon on the beach during July and August without shelter or covering of some sort.

Repeated exposure to sunlight with the aid of an effective sunscreen preparation can produce tan without burn for most people if the periods of exposure are carefully timed, particularly in the early stages. About 20 minutes a day in middle latitudes, a few hundred feet above sea level in midsummer, will produce a barely perceptible reddening on the untanned skin. Exposure during the hours from 11 A.M. to 2 P.M. should be particularly avoided by those who are sensitive to the sun and who burn but do not tan.

There have been some complaints that suntan preparations stain bathing suits and caution will need to be observed by the wearer of certain types of suits in applying any cream or lotion. The three lotions of the 12 tested by Consumers' Research in 1958 that produced no visible stain under the conditions of test were: *Coppertone Suntan Lotion, Florida's Lanotan,* and *Sun'N'Surf.* In the spring of 1958, *Tartan 21* was also found by the American Institute of Laundering to be non-staining.

Ratings in the table on page 104 are cr58.

Ultraviolet transmittance in percent of 12 nationally distributed sunscreen preparations

Product	Price (including federal tax)	Wave length in Angstrom units					Protection against burn	Rating
		2900	2950	3000	3050	3100		
Bronztan (Shulton, Inc., Clifton, N.J.)	6 fl. oz., $1.38 23c per oz.	0.3	0.0	0.0	0.0	0.0	Good	A
Sea and Ski (Rolley, Inc., South San Francisco, Calif.)	4 oz., $1.21 31c per oz.	0.0	0.0	0.2	0.4	0.7	Good	A
Skolex (The J. B. Williams Co., Glastonbury, Conn.)	2 oz., $1.10 55c per oz.	0.0	0.1	0.1	0.2	0.2	Good	A
Sportswear Cream (Distrib. Helena Rubenstein, Inc., N.Y.C.)	4 fl. oz., $1.65 42c per oz.	0.6	0.1	0.0	0.0	0.2	Good	A
Tartan (McKesson & Robbins, Inc., N.Y.C.	4 fl. oz., $1.08 27c per oz.	0.0	0.0	0.1	0.2	0.8	Good	A
Coppertone Lotion (Douglas Labs. Corp., Miami, Fla.)	4 oz., $1.32 33c per oz.	0.6	0.5	0.3	0.4	0.4	Fair	B
Gaby (Gaby Co., Philadelphia)	2 fl. oz., 39c 20c per oz.	0.0	0.0	0.0	0.2	2.1	Fair	B
Skol Cream Lotion (The J. B. Williams Co., Glastonbury, Conn.)	3¼ fl. oz., 76c 21c per oz.	0.4	0.5	0.6	1.1	2.8	Fair	B
Sun Bronze (Charles of the Ritz, N.Y.C.)	2 fl. oz., $2.20 $1.10 per oz.	0.4	0.2	0.2	0.5	1.9	Fair	B
Sun'N'Surf (Squibb & Sons, N.Y.C.)	6 oz., $1.65 28c per oz.	2.2	0.7	0.1	0.0	0.0	Fair	B
Coppertone Oil (Douglas Labs. Corp., Miami, Fla.)	4 fl. oz., $1.38 35c per oz.	8.8	2.5	1.3	0.5	0.5	Poor	C
Florida's Lanotan (Peau D'Or Sales Corp., Miami, Fla.)	4 fl. oz., $1.10 28c per oz.	12.1	10.6	10.9	12.4	14.9	Poor	C

OBESITY CURES
and reducing methods

Maintaining a fashionable, slim figure is difficult in the United States, because there are so many labor-saving devices in daily use. It is generally agreed that, except in certain abnormal cases, obesity is caused by consuming more calories than the body needs for heat and energy. The technique of reducing the total amount of food eaten, however, is too simple a solution for many people, who prefer to spend money for some pill or potion, a series of exercises, or some mechanical device that promises to take off excess weight in some magical fashion, with little or no effort.

The most effective reducing program calls for three regular meals a day, with special emphasis on a breakfast high in protein such as eggs, fish, and meat. Experts point out that a hearty breakfast gets the body off to a good start, makes it easier to cut down on the amount of food eaten at lunch and dinner, and to forego snacks altogether. Even potatoes, sweets, and bread in small amounts can be included in a reducing diet if a sensible approach of moderation is adopted instead of a crash program for taking off a spectacular number of pounds in a short time. As a matter of fact, the technique of reducing strenuously often defeats its own end when the body rebels against enforced starvation and food intake goes back to normal. Putting weight on, then taking it off, and putting it on again is considered dangerous to health and may cause high blood pressure, with an adverse effect on the heart.

Physical exercise is considered helpful in burning up excess fat, toning the muscles, and improving the carriage. Strenuous exercise, however, will increase the appetite and become self-defeating as a reducing aid. Shrewd merchandisers of many devices are often persuasive in convincing the dieter that he can avoid the inconvenience and effort involved in exercising by using fancy rolling pins, rubber balls mounted in various designs, vibrators, rollers, or one of a number of vibrating or "exercising machines." There is no scientific clinical evidence available, however, to support the claim that any of these devices will roll off fat or reduce the user's weight either on an over-all basis or in particular spots, unless a restricted diet is also followed.

Products sold for aid in weight reduction at the present time may be broadly divided into three groups: (1) sweets to be taken before mealtime represented as helping to dull the appetite and decrease the desire for food, (2) bulk-forming substances such as methylcellulose that form a bulky jell when mixed with water, designed to be taken before a meal to create a feeling of fullness to encourage reduction of food intake, and (3) various drugs, usually of the sympathetic stimulation type that affect the nervous system in such a manner as to reduce the desire for food.

The candy pills, sometimes containing a supplement of vitamins and minerals, are considered quite ineffective unless a restricted diet is carefully followed. The bulk-forming preparations may cause trouble, particularly if the would-be reducer has a tendency to intestinal obstruction. Furthermore, since the bulk accumulates in the large bowel instead of the stomach, it will fail to produce the intended effect of satiety.

Among the drugs currently used in weight reduction preparations is ammonium chloride. The stated purpose is to take the water out of the tissues and the advertising for products containing it sometimes refers to "melting fat away." Since ammonium chloride acts as a diuretic and increases the flow of water from the kidneys, there may be some reduction of weight while the drug is taken. On the other hand, if the user increases his intake of fluids during this period, there may be little or no noticeable effect on his weight. Physicians have advised that the unsupervised use of ammonium chloride medication would be dangerous to those who are sensitive to the drug or who are suffering from certain ailments.

Another drug currently popular in reducing preparations is phenylpropanolamine. This drug is recognized by the American Medical Association as a useful adjunct for controlling the appetite in the dietary management of obesity. The dose recommended is 50 milligrams to be taken two or three times a day before meals or a total of 100 to 150 milligrams daily on a physician's prescription in conjunction with a diet schedule representing reduced food intake. The Food and Drug Administration will not permit the selling of this drug to consumers without a prescription, in doses of more than 25 milligrams. In the amount of 25 milligrams at a time, the 75 milligrams per day maximum dose level is believed to present little, if any, hazard to the user. On the other hand, it is also considered to be ineffective in this amount in depressing the appetite.

If it is considered important for an individual to undertake a formal program of weight reduction, it will be best to consult a physician before experimenting with use of any drugs, for effective results.

C. NOT RECOMMENDED

The following products are considered ineffective in weight reduction unless a program of restricted food intake is carried out conscientiously:

Food preparations and sweets:

Ayds, C.C.P. (Calorie control plan), **Dropex Reducing Cocktail, Fastabs, Formula X-42, Kontrol-R for Your Figure, Profile Bread, RDX, Slim Line Candy Wafers.**

The following contained as one of their essential ingredients phenylpropanolamine hydrochloride:

Curbwate, E.H.P., Hungrex, ND 17, No-Di-Et, Regimen Tablets.

Weight-reducing devices:

Deluxe Electric-Transform Bulge Massager, Shoo for reducing fat legs, **RelaxAcizor,** and a variety of vibrating and massaging pillows and other new devices much advertised by department stores and other outlets, and by mail-order firms.

TOILET SOAPS

Cleanliness is the foundation of an attractive appearance. Cleansing the skin with mild soap and water is the most effective method except for those few who experience an unpleasant reaction to some ingredient in a particular brand. Most toilet soap is known as milled soap. Other soaps include castile, which is no longer made exclusively from olive oil but may utilize other fats and oils; floating soaps that have air beaten into them; superfatted soaps that contain lanolin or some other emollient; special soaps that contain some abrasive to provide vigorous cleansing action on heavily embedded soil; and medicated soaps that contain sulfur or some antiseptic designed to reduce bacterial flora of the skin. For people whose skins do not tolerate soap, there are synthetic bars that are also advantageous for use in hard-water areas, such as *Dove* (Lever Bros. Co.), *Vel Beauty Bar* (Colgate-Palmolive Co.), and *Zest* (Procter & Gamble).

Soap and water are effective, not only in removing soil, but in eliminating perspiration odor. Studies have indicated that soap containing the bacteriostat hexachlorophene (trade names G-11, AT-7, K-34) found in *Dial* and *Charles*

Antell soaps, for example, has a certain effectiveness in reducing perspiration odor when used regularly. Other soaps that have bacteria-controlling properties include *Lifebuoy* with *Puralin* (TMTD), *Fresh, Marvelous Shampoo,* and *Dainty* with *Actamer.*

While bacteriostats in soap have some effectiveness in reducing perspiration odor, claims for medicinal properties of such ingredients as sulfur, tar, pine oil, etc., are not substantiated by competent scientific evidence. Medication in soap has little or no anti-infective benefit. Only one soap, *Neko* (Parke Davis & Co.), was found to be effective against bacteria in a short period of use in a study of eight brands by the American Medical Association.

In a test of a number of well-known brands purchased by CR in the fall of 1953, the following fully met Federal Specifications for Milled Toilet Soap (P-S-621c). Only one, however, was free from coconut or palm oil, to which some people are sensitive or which may have a drying effect on the skin.

Avon Pine Soap (Avon Products, Inc.)

Camay Toilet Soap (Procter & Gamble)

Conti Olive Oil Castile Soap (The J. B. Williams Co.) The only brand tested that did not contain coconut or palm oil.

Charles Antell Soap with lanolin, chlorophyll, and hexachlorophene (Distributed by Charles Antell, Inc.)

Dial Deodorant Bath and Toilet Soap (Armour & Co.)

Fresh Deodorant Bath and Toilet Soap (Distributed by The Pharma-Craft Corp.)

Ivory Soap (Procter & Gamble)

Lifebuoy Health Soap with "Puralin" (Lever Bros. Co.)

Palmolive (Colgate-Palmolive Co.)

Swan Floating Toilet Soap (Lever Bros. Co.)

Sweetheart Toilet Soap (Manhattan Soap Co.)

Woodbury (The Andrew Jergens Co.)

Wrisley Pine Soap (Allen B. Wrisley Co.)

Special inquiries

Many topics mentioned in this *Annual* are discussed only briefly, because of space limitations. Sometimes the subject has received more full and detailed treatment in the Bulletin issues cited as references in many sections. We urge our readers to refer to the monthly Bulletin issues cited before asking Consumers' Research by letter to furnish details on some topic of interest.

On the other hand, we are glad to give readers additional help by letter to the extent that it is practicable to do so. We ask readers who wish special help by letter, however, to state how soon an answer is needed and to remit with their inquiry a check or money order for not less than $2, to indicate that the information is of sufficient importance and value to them to be worth our spending time of our staff in providing it.

If the data are available from our files and if their preparation does not involve work out of proportion to the remittance sent, we shall try to provide such information as we can.

If we are unable to answer the question usefully, or in the degree of detail the subscriber might desire (as will often be the case), or to reply soon enough to be of service, or to suggest sources of information elsewhere on the topic that we deem suitable and helpful, we shall cheerfully refund the amount sent in, after deducting in each case, a small sum of 20 to 40 cents to cover a part or all of the cost of handling, writing, mailing, and filing. Please bear in mind that we cannot, of course, guarantee that the information we send will be just what is wanted, or that it will fully serve the purpose the subscriber has in mind. There is no one, anywhere, who can provide answers to even a major part of the questions on which consumers would like to have information!

Medicines, dentifrices, hearing aids

Vitamin preparations • aspirin • clinical thermometers • food poisoning • antibiotics dentifrices and the teeth • X-radiation and radioactivity • transistor hearing aids

VITAMIN PREPARATIONS

The sale of vitamin preparations is a big business in the United States, running to about 300 million dollars, all because some millions of people mistakenly believe advertising which tells them that vitamin pills, tablets, and liquids will somehow correct a feeling of ill health or lack of energy and vigor.

Very few adults have any actual need for extra vitamins. Occasionally there is a deficiency of essential fat soluble vitamins, because of the overuse of commercial fats in cooking (see page 130). More common by far than a general vitamin deficiency is a deficiency of high-grade protein, easily corrected by consuming more lean meat, poultry, eggs, fish, seafood, and non-fat cheese. There is wide variation in the *quality* of the protein available in different foods, and foods treated differently in processing.

The cheaper (starchy and sugary) foods are likely to supply calories almost exclusively and to lack valuable vitamin, mineral, and protein ingredients. (The same is true of refined, factory-processed, packaged cooking fats.)

Individuals have wide variations in their vitamin requirements. In the few cases where a true deficiency exists, the use of vitamin supplements or capsules, under a physician's direction, may be desirable. (For example, for infants and young children, for women in pregnancy, and for nursing mothers, the doctor may prescribe certain vitamins and minerals.) Another example of a necessary use of vitamins is with infants allergic to milk who are on a soybean-milk-substitute diet; such infants must, under the direction of a physician, be given vitamin A to avoid certain serious disease conditions that may sometimes occur from a deficiency of that vitamin.

Vitamin preparations (containing vitamin A and D particularly) can actually be harmful to health, even causing a kind of poisoning. The problem is a subtle one and whether injury will be done in particular cases depends upon delicate questions of food balance, which the layman is entirely unqualified to judge. Even defective sight, or kidney disease, may result from unwise use of vitamin D in combination with the drinking of considerable milk.

Among vitamin preparations recently popularized in a large-circulation magazine is "Royal Jelly," an alleged miracle substance from the beehive, supposed to contain sex and longevity factors—"the queen bee's Fountain of Youth." Gross misrepresentation is a regular characteristic of the advertising of cosmetics and other preparations containing Royal Jelly. No reputable and qualified source has characterized this substance as having either cosmetic or nutritional value for a non-bee population.

The money that is spent on vitamin and mineral preparations could be much better used for purchase of wholesome foods, particularly foods that are high in "high-quality protein" such as meat, poultry, eggs, fish, seafood, and non-fat cheese. All essentials of good nutrition are abundantly available in the normal food supply—if one avoids excessive consumption of fats and sugar and of factory processed and canned foods—and no special formulations or mixtures of vitamins are needed or desirable (except under special circumstances already mentioned). Some of the door-to-door selling of vitamin preparations is highly unscrupulous, of a high-pressure nature and much against the consumers' interest; the prices charged by such sellers are commonly outrageously high, several times the normal price for the products.

▶ **REF:** Bulletin, Jan. '58.+++

ASPIRIN NOT A HARMLESS DRUG

Aspirin, though a useful drug, and consumed to the extent of 42,000,000 tablets a day in the U. S., is known to be capable of causing ringing in the ears, nausea, dizziness, or dyspepsia; worse still, it may cause gastric hemorrhage if taken on an empty stomach, and it can be really dangerous for peptic ulcer patients. There is reason for suspicion that aspirin may have caused stomach ulcers.

Long-time advertising of "buffered" aspirin as being superior to old-time aspirin has been proven to be without scientific foundation. Careful medical studies show that buffered aspirin offers no demonstrable advantage over aspirin alone.

CLINICAL THERMOMETERS

Every home medicine cabinet should contain a clinical thermometer that is accurate and easily read. A significant change in body temperature is often an important indication of illness (normal body temperature for adults should fall between 98.2 and 98.9°F, varying with age and other factors).

It is best that hospitals and nursing homes should provide an individual thermometer for each bed to eliminate the hazard that is now present by reason of the fact that a clinical thermometer cleansed in the usual way can transfer one person's disease germs to another. A relatively effective antiseptic solution is one of benzalkonium chloride, 1:1000, in 70 percent alcohol (isopropyl alcohol is satisfactory—the 70 percent type of rubbing alcohol—McKesson and Robbins, Inc., offer this type). A 0.5 percent solution of iodine, also in alcohol, is also effective. The thermometer should first be wiped carefully with a soapy pledget of cotton, then immersed in the disinfecting solution for 10 minutes and then well rinsed off with clean cool water before it is put into the patient's mouth.

A thermometer should not be used until a half hour has elapsed after exercise, eating, drinking, or smoking. For details on the findings very briefly presented above, see BULLETIN cited at the end of the listings.

Do not give weight to the claims of the "certificate" furnished with clinical thermometers. Many of these afford no assurance whatever of accuracy of the instrument.

A. RECOMMENDED

Bedford (Cornell Instrument Co., Brooklyn, N.Y.) $1.25. 1

Eco Service (Eisele & Co.) $1.50. 1

Perfektum (Weinhagen & Hespe Thermometer Div., Popper & Sons, Inc., New York 10) $1.25. 1

Signal No. 755 (Faichney Instrument Corp., Watertown, N.Y.) $1. 1

Binoc No. 5071 (Taylor Instrument Cos., Rochester, N.Y.) $2, with green plastic "whirl-pull" case to facilitate shaking down the mercury column. 2

Eco Findex 143 (Eisele & Co., Nashville, Tenn.) $2, with white plastic case with pocket clip. 2

Instanta No. 5010 (Taylor Instrument Cos.) $1.60, with red and white plastic "whirl-pull" case. 2

Monroe No. 5008 (Taylor Instrument Cos.) $1.50. 2

Pecco No. 125 (Pecorella Mfg. Co., Brooklyn, N.Y.) $1.50. 2

Reflex (Cornell Instrument Co.) $1.50, with black plastic case. 2

Walgreen Special (Distributed by Walgreen Drug Stores; made by Becton, Dickinson & Co., Rutherford, N.J.) $1.75. 2

Cary (Cary Thermometers, 2 Broadway, New York 4) $8.75, with case. 3

Pecco Tripoint (Pecorella Mfg. Co.) $2.50. 3

Red Flash TR102 (Becton, Dickinson & Co.) $2.35. 3

C. NOT RECOMMENDED

Cardinal (Cardinal Thermometer Co., Brooklyn 27, N.Y.) 98c. 1

Philbern (Philbern Thermometer Co., Inc., N.Y.C.) $1. 1

Asepto TA101 (Becton, Dickinson & Co.) $1.60. 2

Regent (Cornell Instrument Co., Ridgewood 37, N.Y.) $1.50, with black plastic case. 2

▶ **REF:** BULLETIN, Dec. '57.+

FOOD POISONING

Foods likely to be implicated in food poisoning cases, which often involve a considerable number of persons at picnics, church suppers, parties at beaches, etc., include ham, turkey, chicken and chicken salad, potato salad, tamales, salmon salad, cream puffs, sausage, meat pies, ground meat, and frozen shrimp. Salads are particularly dangerous because of the finely divided state of the meat, fish, seafood, or potatoes, which tends to favor the rapid spread of the infecting organisms.

A necessary preventive of bacterial food poisoning is to keep the prepared food refrigerated at all times; refrigeration at a low temperature not far above 32°F should begin *immediately* after the cooking and a brief cooling. Do not take any of the questionable types of food on picnics or to the beach unless they can be kept ice cold. Never prepare such foods any substantial length of time before they are consumed.

Dried eggs, much used by restaurants and bakeries, have been a frequent cause of outbreaks of food poisoning. The destruction of disease-producing organisms in egg mixtures is exceptionally difficult. Any large-scale use of dried eggs involves particular hazards. Dried eggs should especially be avoided in uncooked or slightly cooked foods such as egg-milk drinks, omelets, scrambled eggs, cream puddings or fillings, soft custards, and ice cream.

The flavor improver, monosodium glutamate, originally used chiefly in canned soups, is now put into foods of all sorts, including stews, frozen vegetables, fish fillets, chicken à la king, seafoods, meats, poultry, and crackers. A physician has reported that monosodium glutamate caused serious allergy with symptoms resembling those due to gall bladder disease, including epigastric fullness, belching, distention and marked upper-abdominal discomfort, in a mother and her son. The two persons concerned would become sick within half an hour after eating meals of excellent food prepared at home, as well as meals eaten at fine restaurants. While the difficulties of these persons were perhaps exceptional, the instance should be kept in mind for anyone who has digestive distress not readily accounted for.

We advise against the casual use of beverages and foods containing artificial sweeteners, and especially of the widely-sold sugar-free "non-fattening" soft drinks containing a sugar substitute. The complete harmlessness of the various artificial sweetening ingredients, including a number of new ones, has not been established; in past years, two were found, after some time had elapsed, to be definitely harmful to health (one was even a cancer-causing agent).

Spinach is a common table vegetable, eaten in excessive amounts in some regions. Two University of North Carolina doctors reported overuse of spinach as a major cause of kidney stones. (The state is known as a "stone area.") Other foods high in oxalic acid and hence also under suspicion of causing stones in susceptible persons are: chives, beets, kale, okra, peanuts, chocolate, cocoa, and rice.

ANTIBIOTICS

Penicillin and other antibiotics should not be used in any form without prescription. Death may even be the penalty where such a preparation is used by a sensitive person, even with such an apparently harmless medicament as a cough drop or throat lozenge containing an antibiotic drug.

The widespread practice of adding antibiotics and certain toxic drug materials including a variety of arsenic compounds, e.g., arsanilic acid and 3-nitro-4-hydroxyphenyl arsonic acid, to feeding stuffs for farm animals and poultry to increase the rate of growth is rightly a cause for concern, and consumers of meat are justified in questioning the safety of this practice.

Another application of antibiotics that must be regarded with the greatest suspicion is in food preservation; for example, to double the length of time that poultry can be kept before spoilage sets in, it is the practice to permit uncooked, dressed poultry to be treated with chlortetracycline (aureomycin) so long as the residue in the food does not exceed seven parts per million. (The product treated with aureomycin carries a tag or label reading "Acronized.")

Recently a great proportion of milk as marketed has been found to contain penicillin (used to treat diseases of cows). This type of adulteration of milk is surely a serious health hazard.

Such practices are fully open to control by state and city health, food, and drug officials, if they choose to act (usually in response to complaints of their constituents). State officials, though usually not well informed on technical questions connected with food processing and preservation, are much more likely to be responsive to local opinion than are federal agencies, which tend to give far too much weight to their experts' opinions, favorable to industry, on matters of this kind.

DENTIFRICES AND THE TEETH

Competent dentists are generally agreed that, while brushing the teeth after every meal to eliminate particles of food is desirable in preventing dental decay, the use of a dentifrice in connection with the brushing is optional, and a matter of personal taste. Any dentifrice will serve, provided it is free from any added drug materials and is not too harsh or gritty. Penicillin dentifrices should not be used. Neither chlorophyll nor the ammoniated (urea) compounds, also recently popular in dentifrices, reduce tooth decay or have other important values for their users beyond the cosmetic effect of the ordinary ("unimproved") dentifrices.

"Magic" ingredients added to tooth pastes are strictly for sales appeal. There is no satisfactory evidence that any of the special ingredients in dentifrices are of any substantial value in preventing tooth decay, and that includes penicillin as well as such widely advertised "magic" ingredients as *Gardol, Irium,* and *Antizyme.* It is best to avoid any dentifrice which contains a compound of fluorine, e.g., a monofluorophosphate, added with the idea of providing some degree of reduction of dental caries. (The package is required to carry a warning against use by children under six.) Read the fine print on the label before buying!

One physician reported an increased incidence of mouth tissue inflammation with ulcerated areas over a period of 15 months in persons using dental powder or cream which contained a fluoride. (The injury to mouth tissue was found in as many as six members of a single family using a fluoride-containing dentifrice.)

Children who are not permitted to have candies and soft drinks are likely to have better teeth than those who are allowed to develop a taste for sweets. Parents who are concerned for their children's good dental health should see to it that sweets and soft drinks are not used as a convenient substitute for more nutritious foods that require vigorous chewing and are rich in protein, vitamins, and minerals necessary to provide a balanced diet. Teeth that deal only or mostly with soft diets will deteriorate faster than those that are given hard work to do. The wide use of strained, chopped and soft baby food is bad for health, in that it tends to get a child into the habit of eating without chewing and so he becomes averse to chewing tough, resistant foods in later years. Children and grownups should both have hard food to chew on, including hard-crusted breads, pumpernickel, or Italian or French bread, instead of the soft loaf now predominant and in public favor. Babies should be taken off strained baby foods as early as possible.

Especially harmful to the teeth is the practice of holding cough drops, throat lozenges, or other sweets in the mouth. The drinking of acid fruit juice and of soft drinks, particularly the cola beverages which contain a strong mineral acid, very often causes pronounced erosion of tooth enamel. Lemon juice is a strong corrosive to teeth; excessive use of orange or grapefruit juice can also be harmful.

DANGERS IN X-RADIATION AND RADIOACTIVITY

It is customary to consider harmless certain routine uses of X-ray including chest X-rays, the use of X-ray after accidents and injuries to find broken bones, and the use of X-rays in various medical treatments. Dentists use X-rays for locating cavities in teeth. There is a widely used fluoroscopic device to determine the fit of shoes, particularly in children. Experts hold that fluoroscopic fittings are undesirable and sometimes dangerous in the fitting of children's shoes. The improper use of such a device can be extremely serious. (Pennsylvania recently banned X-ray shoe-fitting machines by health department regulation; other states should take similar action, by law or regulation.) It has become clear that the use of X-rays in medical and dental practices should be held to the lowest practicable minimum. X-ray diagnostic procedures should not be used unless a physician regards the action as absolutely necessary. The potential genetic effects will not be in evidence during the physician's lifetime, and the sufferers will be the descendents of his patients. The routine examination by pelvic irradiation of women of childbearing age to detect pregnancy has been criticized, when such diagnoses were not restricted to the first two weeks following a menstrual period.

There is no such thing as a "safe level" of exposure to radiation. All ionizing radiation (from radium, X-rays, cosmic rays, atomic and H-bomb fallout, etc.) damages the body and shortens life. Even self-luminous dials on watches and clocks may add to the hazard in a substantial degree and a radium dial watch should not be worn unless really needed. As new uses for radiation and radioisotopes are developed, each new use makes the potential of increased hazard greater.

Every X-ray film that is taken is using up a part of the patient's reserve against excess radiation. A leading expert believes that the total exposure by the age of 30 years should not exceed 10 roentgens. Your physician, however, must be the judge of whether diagnostic X-rays or radiation treatments are required in any given case.

MISCELLANEOUS NOTES
on matters related to health

Colds and allergies

The common cold is often due, not to virus, but to an allergy (allergy ranks highest among chronic ailments in children), often caused by irritation from dust, animal hairs, poor ventilation, use of milk by persons sensitive to it.

The popular gin-and-tonic drink may have unfortunate aftereffects; a considerable number of persons are sensitive to quinine, and there is the possibility of deafness, vertigo, impairment of the vision, headaches, fever, abdominal distress, and skin eruptions. In sensitive persons even a minute dose of quinine may produce a severe reaction.

Tranquilizing drugs

One should be very hesitant to use any of the new tranquilizing drugs. There is a long history of use of tranquilizer substances in various times and places, and their use has been unfavorable to health and progress. These drugs, now very popular, and much sold in pharmacies, should be employed, if at all, with the utmost caution and restraint; some of them, if used in very hot weather, may bring on the grave danger of heat stroke.

Dangers of long sitting

Persons with a tendency to varicose veins should avoid standing or sitting still in one place for long periods. When traveling, make it a point to get up and stretch the legs every half hour. Especially important, while viewing television, put your feet on a stool to reduce constriction of venous circulation; get up and move about at fairly frequent intervals. Women should never wear round garters and should not wear elastic girdles for more than short periods of time.

TRANSISTOR HEARING AIDS

Don't expect phenomenal results simply because an aid uses the new transistors. Aids using transistors have the great advantage of compactness and very great savings in battery replacement costs but transistors do not in themselves guarantee good performance.

Violent explosions of mercury-type hearing aid battery cases have occurred when batteries were burned with trash, and there is danger of severe injury. Return dead batteries to the dealer for disposal.

In purchasing an aid, it is well to select an established dealer who has good repair facilities, an ample stock of parts, and a reputation for giving quick service to the user when needed.

Only very brief listings are included. The references given contain much more complete information. The later model transistor aids tested in 1956 had much reduced transistor and circuit noise as compared with those tested in 1955. Models tested in 1955 are indicated by an asterisk (*). Tests on several of the new eyeglass and "behind the ear" aids are now in progress and will be reported at a later date.

A. RECOMMENDED

Zenith 50X (Zenith Radio Corp., 5801 W. Dickens Ave., Chicago 39) $65 complete. Suitable for slight and medium hearing loss. 1

Paravox, Model SH* (Paravox, Inc., 2056 E. Fourth, Cleveland 15) $175. For slight hearing loss. 2

Paravox, Model S* (Paravox, Inc.) $175. For slight hearing loss. 2

Audivox, Model 71* (Audivox, Inc., 123 Worcester, Boston 18) $250. Suitable for slight or medium hearing loss. 3

Audivox "Micronette" (Audivox, Inc.) $190. Suitable for slight and medium hearing loss. 3

Beltone, Model C* (Beltone Hearing Aid Co., 2900 W. 36, Chicago 32) $280. Suitable for slight or medium hearing loss. 3

Beltone, Model AL* (Beltone Hearing Aid Co.) $280. For slight hearing loss. 3

Paravox, Model R* (Paravox, Inc.) $285. For slight hearing loss. 3

Sonotone 100 (Sonotone Corp., Elmsford, N.Y.) $260. Suitable for slight hearing loss. 3

B. INTERMEDIATE

Acousticon, Model A-340* (Dictagraph Products, Inc., Jamaica 35, N.Y.) $124.50. For slight hearing loss. 1

Zenith Crusader (Zenith Radio Corp.) $135. Suitable for slight and medium hearing loss. 2

Zenith Regent (Zenith Radio Corp.) $165. Suitable for slight, medium, and severe hearing loss. 2

Maico Transist-Ear V (Maico Co., Inc., 21 N. Third, Minneapolis 1) $258. Suitable for slight and medium hearing loss. 3

Paravox, Model RH* (Paravox, Inc.) $285. For slight hearing loss. 3

Radioear, Model 830* (Radioear Corp., 306 Beverly Rd., Pittsburgh 16) $285. For slight to medium hearing loss. Suitable for severe hearing loss if used with external 4.5-volt battery. 3

Sonotone 1200 (Sonotone Corp.) $279. Suitable for slight and medium hearing loss. 3

Telex 17 (Telex, Inc.) $310. Suitable for slight and medium hearing loss (aid tested with 2.5-volt battery; might be suitable for severe hearing loss if 5.2-volt battery was used). 3

Telex Eyeglass Aid (Telex, Inc.) $200-$215. Suitable for very slight hearing loss only. 3

▶ **REF:** Bulletin, May '55+++, May '56+++.

Home workshop tools

Circular saws, bench and portable • chain saws

electric drills • portable sanders • screwdrivers

THERE ARE a number of serious hazards in the use of power tools. For a discussion of electrical shock, fire, and other hazards, see "Safety in the home," pages 94-98.

The first power tool purchased by anyone contemplating a home workshop should undoubtedly be a portable electric drill; this would be followed by a bench- or cabinet-type circular saw. (For most users a bench or cabinet saw is to be preferred to the portable type, as the fixed saw is capable of more accurate work.) Portable tools such as sanders, saber saws, etc., can be purchased later, as the need arises.

CIRCULAR SAWS

In buying a saw, look for well-made safety features, a fairly large, smooth saw table (preferably with table extensions available), and well made, easily adjusted rip fence and miter gauge. The length of the part of the table in front of the blade determines how wide a board can be cut with the use of a miter gauge. A capacitor-type motor of at least ½ horsepower is best for an 8-inch saw, and the motor switch should be located for quick accessibility. If there is a child in the home, the switch should be of a type that can be *locked* and the key placed where it will under no circumstances be accessible to the child.

A saw having a table that tilts is not as desirable as a saw with a tilting arbor, because the work is not well supported in making bevel cuts.

A circular saw is potentially very dangerous and must be used with great care. No power saw should be purchased or used without safety accessories such as: blade guard, splitter, and anti-kickback fingers.

Ratings are cr55.

Tilting-arbor saws, 8-inch

A. RECOMMENDED

Atlas, Model 3021 (Atlas Press Co., Kalamazoo, Mich.) Complete with table extension, saw guard, ¾-hp. motor, V-belt, and motor pulley, $177.50. This saw without table extension and motor, $108.75. Motor tilted with saw (good). The plastic window of the saw guard would collect sawdust and obstruct view of the blade. Judged a well-machined tool of good design. 2

B. INTERMEDIATE

Craftsman (Sears-Roebuck's Cat. No. 99—02424) Saw, including guard, $48, plus freight. Complete with table extensions, ½-hp. motor, pulley, and V-belt, $94, plus freight. Motor mounted on a separate tilted bracket which did not tilt with saw. Saw guard obstructed view. General construction, only fair; table surface was roughly machined. 1

Atlas, Model 9310 (Atlas Press Co.) Saw, including guard, $67.50. Complete with table extensions and ½-hp. motor, $129.50. Motor is mounted on bench and does not tilt with saw. Machining of table was rough; otherwise the *Atlas 9310* was judged a well-built tool. 2

Craftsman (Sears-Roebuck's Cat. No. 99—02104) Saw, including guard, $77, plus freight. Complete with table extensions, saw guard, ½-hp. motor, and switch, $127.25, plus freight. Motor slid horizontally but did not tilt with saw. General construction, fair; machining of table somewhat rough. 2

Duro Master, Model F3013 (Duro Metal Products Co., 2651 N. Kildare Ave., Chicago 39) Saw, including guard, $67, plus freight. Complete with ½-hp. motor, V-belt, pulley, and table extensions, $132, plus freight. Motor was separately mounted but tilted with saw (good). A sturdy well-built saw which should be adequate for most home workshop use. 2

Sprunger, Model D (Sprunger Bros., Inc., Topeka, Ind.) Saw, including guard, $75, plus freight. Complete with table extensions, saw guard, ½-hp. motor, pulley, and V-belt, $131, plus freight. Motor tilted with saw (good). Judged a well-made saw with many good features, which are partly offset by a poor miter gauge. ¶*Model G* at same price is similar. 2

C. NOT RECOMMENDED

Shopmaster, Model HM2 (Shopmaster, Inc., Minneapolis) Saw, including guard, $80.50. Table of aluminum, not a desirable material for this purpose, as miter-gauge slots are likely to wear rapidly and become inaccurate. Machine is on a base of light sheet metal. 2

Shopmaster, Model HM4 (Shopmaster, Inc.) Saw, including guard, $65.50. See comments on *Model HM2.* 2

▶ **REF:** Bulletin, Dec. '55.+++

Tilting-arbor saw, 10-inch

A. RECOMMENDED

Delta Unisaw (Rockwell Mfg. Co., Pittsburgh 8) Cabinet-model saw, including guard, $262.50. Complete with extension wings, 1½-hp. motor and switch, $444, plus freight. 3

Portable electric circular saws

In careful and skillful hands a portable electric circular saw can save a tremendous amount of time, but if used carelessly it can cause permanent grave injury or death to its operator or to another person. It is very important to check that the saw guard is operating properly and that the work is well supported before beginning a cut. The blade should be kept sharp and the saw base should ride on the supported part of the work. *Always* connect the ground wire to a good ground before plugging in the saw. Always pull the plug when the saw is not in use, especially when changing a blade.

The saws were tested for horsepower, temperature rise of motor, stalling, revolutions per minute at no load, radio and TV interference, noise, ease of handling, depth of cut, and electrical safety. Then the saws were disassembled and examined for workmanship, construction, materials, probable durability, etc.

A. RECOMMENDED

Cummins Maxaw, Model 717 (John Oster Mfg. Co., 5055 N. Lydell Ave., Milwaukee 17) $50. A satisfactory tool of adequate power, but temperature rise was high (not considered important for light intermittent use). 2

Black & Decker, Cat. No. U-62 (The Black & Decker Mfg. Co., Towson 4, Md.) $59.50; a rip fence, $2.10 extra. Judged a sturdy, well-made tool of ample power. Discontinued. ¶New model, *No. 63,* at $69.50 is similar. 3

B. INTERMEDIATE

Millers Falls (Millers Falls Co., Greenfield, Mass.) $40 for power unit No. 1888; $19 for No. 8811 portable saw; total price, $59. Considerably less powerful than most portable saws, but satisfactory for light work. Consists of power unit and saw attachment. Other accessories are available including bench saw, jig saw, sanders, grinder, etc. Complete "Power Workshop," $160. Temperature rise was high, and horsepower and no-load rpm. were low. 2

Porter-Cable Homemaster, Model 125 (Porter-Cable Machinery Co., 1714 N. Salina, Syracuse 8) $49.50. Temperature rise under load was much too high. Only saw tested equipped with friction washer permitting saw blade to slip on arbor if jammed (desirable). 2

Skil Special, Model 516 (Skil Corp., 5033 Elston Ave., Chicago 30) $44. A saw of adequate power, well made except for one important detail—the coil spring device for carrying current to the brushes broke and fell against the casing, making the entire saw electrically "hot." This also happened with another saw, *Skil Model 520,* known to CR, after a few years' use. ¶*Model 516* has been discontinued and replaced by *Model 536* at $55. 2

C. NOT RECOMMENDED

Stanley Handyman, Model H65-A (Stanley Electric Tools, New Britain, Conn.) $60. Failed in proof-voltage test. 3

▶ **REF:** Bulletin, Jan. '55.+++

POWER CHAIN SAWS

A portable gasoline engine power saw has become an almost indispensable tool to those who do much cutting of timber. Two types of chain saws are available: the direct-drive saws, used primarily for cutting pulpwood and small logs, and the reduction-drive saws, which have an advantage on larger timber and hardwoods. Direct drive, with its greater chain speed, has reduced the tendency of chain saws to kick and grab, thus making for greater safety (although any chain saw can be extremely dangerous and must be used with constant care and vigilance). A newer type which uses a reciprocating blade and is much safer to use than a chain saw is now available (see listing of *Wright Rebel,* page 114).

The diaphragm carburetor, although more expensive than the float type, is considered well worth its extra cost for most users. It makes it possible to use the saw in any position, even upside down.

Proper maintenance of a chain saw is very important. The saw should be kept clean, and lubrication and other maintenance should be in accordance with the manufacturer's instructions. Never attempt to fill the gasoline tank with the engine running.

Choice of the particular saw to be purchased should be based largely on the availability of parts and competent service in your locality.

Ratings in tables on page 114 are cr56.

▶ **REF:** Bulletin, Nov. '56.+++

RECIPROCATING-BLADE POWER SAW

This new type of saw cuts very slowly compared with a chain saw, particularly when trees or logs being cut are larger than 6 inches in diameter. Because these new saws are much

TABLE I—DIRECT-DRIVE CHAIN SAWS

Manufacturer	Model	Price*	Weight* (lb.)	Advertised hp.	At rpm.	Bore & stroke (inches)	Carburetor	Minimum stump height (inches)	Rating
Clinton Machine Co., Clinton, Mich.	Wood Whittler	$170	27	3	4200	1-7/8 x 1-5/8	Float		B
	D-3	200	27	5	4800	2-1/8 x 1-5/8	Float		A
	D-4	250	27	5	4800	2-1/8 x 1-5/8	Diaph.		A
Homelite Div. of Textron American, Inc., Port Chester, N. Y.	EZ	239 (21")	23	5	7000	2-1/16 x 1-1/2	Diaph.	1-1/2	A
I.E.L. Power Saws, 1112 Westlake North, Seattle 9, Wash.	HM	264	29	5	4000	2-1/16 x 1-9/16	Diaph.	3-1/2	AA
	JA	355	32	7	4000	2-9/16 x 1-9/16	Diaph.		A
	HB	249	29	5	4000	2-9/16 x 1-9/16	Float		B
Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill.	4MG	250 (18")	30	5	5000	2-1/4 x 1-5/8	Diaph.	2-1/2	A
Monark Silver King Inc., 6501 W. Grand Ave., Chicago 35, Ill.	SK18	199 (18")	28	3	5000	2 x 1-1/2	Float	1-1/2	B
Strunk Chain Saws, Inc., Coatesville, Pa.	SpeeDemon Special	195 (19")	25	3-1/2	4500	2 x 1-1/2	Float	Flush	B
	Big Timber SpeeDemon	245 (19")	27	5	4500	2 x 1-5/8	Diaph.	Flush	A
Titan Chain Saws, Inc., 2700 4th Ave., S., Seattle 4, Wash.	30	245 (18")	29	3	4500	2 x 1-5/8	Diaph.	3	A
	70	375 (18")	36	6-1/2	4500	2-1/2 x 1-5/8	Diaph.	3	A

* With 20-inch bar and chain except as noted.

TABLE II—REDUCTION-DRIVE CHAIN SAWS

Manufacturer	Model	Price*	Weight* (lb.)	Advertised hp.	At rpm.	Bore & stroke (inches)	Carburetor	Minimum stump height (inches)	Bars available (inches)	Rating
Clinton Machine Co., Clinton, Mich.	323	$228	29-1/4	3	4500	1-7/8 x 1-5/8	Float	5‡	12-42	B
	525	288	29	5	4500	2-1/8 x 1-5/8	Diaph.	5‡	12-42	A
Homelite Div. of Textron American, Inc., Port Chester, N. Y.	17	282	25	3-1/2	6200	2 x 1-3/8	Diaph.	Flush w. ground	14-38	A
	5-20	320	24	5	7000	2-1/16 x 1-1/2	Diaph.	1-1/2	14-60	AA
	7-29	425 (23")	33	7			Diaph.		18-60	B
Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill.	0MG	205 (12")	29	3-1/2	6500	2-1/6 x 1-1/2	Float†		12-42	B
	1MG	272 (18")	36	3-1/2	7400	2-1/6 x 1-1/2	Float†	1-1/2	18-42	B
	2MG	312 (18")	38	5-1/2	8000	2-1/4 x 1-5/8	Float†	1-1/2	18-54	B
	3MG	312 (18")	40-1/2	5-1/2	5000	2-1/4 x 1-5/8	Diaph.	5	18-54	A
McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif.	33B	223	20	2	5000	1-3/4 x 1-3/8	Diaph.	3	12-30	A
	47	314 (18")	28-1/2	5	5000	2 x 1-1/2	Diaph.	5	14-42	A
	4-30A	349 (18")	32	6	5000	2-1/8 x 1-1/2	Diaph.	5	14-42	A
	73	409 (18")	32	7	5000	2-1/2 x 1-1/2	Diaph.	4	14-42	A
Strunk Chain Saws, Inc., Coatesville, Pa.	Eager Beaver	185 (19")	28	2-1/2	4500	2 x 1-1/2	Float		16-19	B
	Busy Beaver	211 (19")	28	4	4500	2 x 1-1/2	Diaph.		16-24	A
	Custom Pro	235 (19")	27	4	4500	2 x 1-1/2	Diaph.		16-30	A
	Big Timber Pro	265 (19")	29	5-1/2	4500	2 x 1-5/8	Diaph.		16-30	A
Titan Chain Saws, Inc., 2700 4th Ave., S., Seattle 4, Wash.	75		36	7	4500		Diaph.		22-108	B

* With 20-inch bar and chain except as noted. † Diaphragm carburetor also available. ‡ Low cutting attachment available.

safer than the chain saw, they have a pronounced advantage for those who value safety above high cutting speed.

A. RECOMMENDED

Wright Rebel, Model GS-2520 (Wright Power Saw & Tool Corp., 410 S. Third St., Louisville 2, Ky.) $189.50. 20-in. blade, 1-7/16-in. stroke. Direct drive. Two-cycle twin-cylinder engine. Weight, about 25 lb.

ELECTRIC HAND DRILLS

The housing of a portable tool should always be grounded when in use. None of the drills tested had the desirable 3-prong grounding plugs, but, unless otherwise noted, they did have 3-wire cords with a "pigtail" grounding connection, which is not a sure safeguard, and may, if incorrectly or carelessly used, be dangerous. (For discussion of grounding portable tools, see "Portable sanders," page 115.) Considerations in rating the drills were speed of the drill shaft, torque, horsepower, temperature rise in use, design, workmanship, and proof-voltage and leakage-current tests.

A. RECOMMENDED

Black & Decker Utility, No. U-1 (The Black & Decker Mfg. Co., Towson 4, Md.) $27.95 with Hex-Key chuck, $29.95 with geared chuck. Listed by *UL*. ¶*Cat. No. U-100* with geared chuck, at $18.95, is similar.

Cummins 44 Ball Rite (John Oster Mfg. Co., Milwaukee 17) $29.95 with geared chuck. Standard duty. *UL*. ¶*Model 306,* at $35, is similar.

B. INTERMEDIATE

Cummins, Model 38 (John Oster Mfg. Co.) $21.95 with geared chuck, $17.95 with hand-tightening chuck. Lacked needed ground wire (undesirable, see text). *UL*. ¶*Models 303* and *304,* at $20 and $25, respectively, are similar.

Mall, Model 149B (Mall Tool Co., Chicago) $28.50 with geared chuck. Lacked ground wire (see text). *UL*.

Millers Falls 888 (Millers Falls Co., Greenfield, Mass.) $45 including sanding and buffing accessories. Part of "Power Workshop" (see listing under "Portable electric circular saws," p. 113).

C. NOT RECOMMENDED

Porter-Cable, Model 107 (failed proof-voltage test).

▶ **REF:** Bulletin, Feb. '54.+++

Drill accessories

A. RECOMMENDED

Dril-Level (M & J Specialty Co., Red Hook, N.Y.) $4.95. Useful device for drilling at a desired angle.

B. INTERMEDIATE

Babco 5 to 1 Speed Reducer (Babcock Mfg. Co., 6253 Claremont Ave., Oakland 18, Calif.) $9.95, with three adapters to fit different chucks and a screwdriver bit with finder sleeve for No. 10-12 screws. Gives an actual speed reduction of 4¾ to 1 and increases stalling torque 3⅓ times.

PORTABLE SANDERS

In CR's opinion the work produced by the orbital sanders would be satisfactory for any except the most critical craftsman doing work of the highest type. Orbital sanders are more effective in speed of removal of wood than straight-line sanders and thus are more suitable for all coarse and semi-finishing operations. Orbital sanders are also excellent for sanding the end grain of wood.

For safety, all portable tools should be equipped with three-wire cords. It is strongly recommended that a special three-opening receptacle for use with three-prong plugs be installed and used, rather than to rely upon an adapter device which permits plugging the three-prong plug into a two-slot outlet. Unless otherwise noted the sanders listed were equipped with three-wire cords and grounding plugs.

CR's tests included electrical safety, ease of operation, speed measurements by stroboscope, and measurements of actual material removed by sanding from soft wood, hardwood, and *Masonite* hardboard, under controlled conditions.

Orbital type

A. RECOMMENDED

Pet, Model 200 (Portable Electric Tools, Inc., Chicago 20) $39.50. A-c shaded pole motor rated at 3.5 amp. 3450 o.p.m. (orbital motions per minute). Weight, 8 lb. (heaviest sander tested). *UL* label. 2

Black & Decker, Model U-44 (The Black & Decker Mfg. Co., Towson 4, Md.) $45. Ac-dc motor rated at 1.5 amp. 3500 o.p.m. Weight, 6¼ lb. Motor drives sanding pad through a V-belt. CSA (Canadian Standards Association) label. Listed by *UL*. 3

B. INTERMEDIATE

Skil, Model 592 (Skil Corp., Chicago 30) $49.95. Ac-dc motor rated at 2 amp. 4800 o.p.m. Two-wire cord, 7 ft. long, with no provision for grounding (undesirable). Weight, 5 lb. 15 oz. Motor drives sanding pad through a round-section belt. *UL* label. 3

C. NOT RECOMMENDED

Porter-Cable, Model 145 (Porter-Cable Machine Co., Syracuse 8) $34.50. *UL* and CSA labels. Failed to pass high-voltage test for electrical safety. 2

Stanley Pad Sander, Heavy-Duty Model H36-A (Stanley Electric Tools, Div. of the Stanley Works, New Britain, Conn.) $49.95. *UL* and CSA labels. Failed to pass high-voltage test for electrical safety. 3

Straight-line vibrator type

B. INTERMEDIATE

Dremel, Model 2000 (Dremel Mfg. Co., Racine, Wis.) $19.95. Vibrator-type motor rated at 90 watts. 7200 strokes per min. Two-wire cord, 7 ft. 8 in. long, with no provision for grounding. Weight, 5 lb. Listed by *UL*. 1

C. NOT RECOMMENDED

Craftsman, Model 110.7600 (Sears-Roebuck's Cat. No. 9—760) $30, plus postage. A-c vibrator-type motor rated at 2 amp. *UL* label. Failed to pass high-voltage test for electrical safety. 1

Double-action type

A. RECOMMENDED

Fairchild Dualine, Model 1253 (Fairchild Industries, Burlington, Vt.; Montgomery Ward's Cat. No. 84—8541M) $37.95, with two interchangeable platens—one for orbital sanding and one for straight-line sanding. Ac-dc motor rated at 1.8 amp. 5250 o.p.m. Weight, 5 lb. 5 oz. Motor drives sanding pad through a toothed rubber belt. *UL* and CSA labels. 2

B. INTERMEDIATE

Cummins Double Action (John Oster Mfg. Co., Milwaukee 17) $49.95. Ac-dc motor rated at 1.5 amp. 3200 o.p.m. Weight, 5 lb. 6 oz. Motor drives sanding pad through a toothed belt. The *Cummins* changed from orbital to straight-line motion by turning a removable key. 3

Orbital sanding attachments

For those who do not do a sufficient amount of sanding to warrant the purchase of one of the tools previously listed, but who own a suitable portable electric drill, it may be in order to purchase a sanding attachment for use with the drill. While, in general, such tools take much longer to produce a satisfactory finish than appliances specially made for sanding, owing to the slower speed at which most of them operate, the sanding attachments are capable of doing a satisfactory job.

B. INTERMEDIATE

Black & Decker, Cat. No. U-1016 (Black & Decker Mfg. Co., Towson 4, Md.) $16.95. Can be used only with *Black & Decker* ¼-in. utility drills, *Model No. U-1, U-3, U-100,* and *U-50* all-purpose drill, driving sanding pad directly. 2

Millers Falls, Model 882 (Millers Falls Co., Greenfield, Mass.) $17.45. For use only with *Millers Falls No. 888 Power Unit Drill.* 3200 o.p.m. 2

C. NOT RECOMMENDED

Craftsman, Model 605-27190 (Sears-Roebuck's Cat. No. 9—2719) $9.44, plus postage. Can be used with most ¼-in. electric drills having a speed of 1500 rpm. or more. 1

Mall, No. 50590 (Mall Tool Co., 7740 S. Chicago Ave., Chicago 19) $15.95. Can be used only with *149 Series Mall* drills, driving sanding pad directly. Because of excessive vibration, the *Mall* device was tiring to operate, difficult to keep level, and did not sand uniformly. 2

▶ **REF:** Bulletin, Jan. '58.+++

COMBINATION POWER TOOL

The combination tool has its limitations, but may be a good compromise choice for many hobbyists who wish to keep low the cost of equipping a serviceable shop.

B. INTERMEDIATE

Shopsmith Mark 5 (Magna Engineering Corp., San Francisco) $329.50, including ¾-hp. motor. Combination circular saw, disk sander, horizontal and vertical drill press, and wood lathe. Good, on the whole.

PAINT SPRAYERS

Electric-vibrator-type paint sprayers are much less expensive and more convenient than those having a separate motor-driven air compressor and tank. Home handymen, attracted by large-scale newspaper and magazine advertising, have purchased large numbers of the appliances. Unfortunately they usually do not work well. One should be purchased only on a "full-money-back" basis, if at all. It was not possible to adjust the control to produce a satisfactory spray for fine work with either of the makes tested.

C. NOT RECOMMENDED

Super Jet Spray Gun (Power Products, Inc., 175 E. 87, New York 28) $29.95 for kit, including spray gun and accessories. Three samples all failed in endurance tests. One showed very high shock hazard on failure. cr55

Burgess Electric Vibro-Sprayer, Model VS-500 (Burgess Battery Co., Handicraft Div., Lake Zurich, Ill.) $12.95. One sample did not work at all; the second gave unsatisfactory results. cr50

▶ **REF:** Bulletin, Jan. '50, Sept. '55.

SCREWDRIVERS

It is important to use a screwdriver of the right size and type for each job. The tip should fit without excessive clearance in the screw slot and should be wide enough almost to fill the length of the slot.

The wood or plastic handles of all the drivers tested could be ignited by the flame of an ordinary match. Several of the wooden handles flared up quickly when lit because of the finishing materials used on their surfaces; others were harder to ignite and burned slowly.

Sizes given in the listings such as 4 x ¼, mean that the blade length, from its tip to the bottom of the handle, is four inches and the tip width is ¼ inch. Because of space limitations, only the *A*-rated screwdrivers are listed.

Ratings are cr57.

A. RECOMMENDED

Proto 9604 (Proto Tools, Los Angeles 54) $1.15. 4 x ¼. Amber plastic handle. 3

Yankee, No. 90 (North Bros. Mfg. Co., Div. of Stanley Works, Philadelphia 33) Two samples tested, 5 x 5/16 at $1.10 and 4 x ¼ at 95c. Black wooden handles. 3

* * *

Great Neck (Great Neck Saw Mfrs., Inc., Mineola, N.Y.) 25c. 4 x ¼. Black wooden handle. Tip deformed slightly in the torque test. 1

Irwin 400 (Irwin Auger Bit Co., Wilmington, Ohio) 65c for *No. 400-6"*, 6 x 5/16; 48c for *No. 400-4"*, 4 x ¼; 40c for *No. 400-3"*, 3 x 3/16. Amber plastic handles. 2

Stanley 100 Plus, No. 1006 (Stanley Tools, New Britain, Conn.) $1.25. 4 x ¼. Amber plastic handle with black trim. Tip deformed slightly in the torque test. 3

▶ **REF:** Bulletin, June '57.+++

BLOW TORCH

A. RECOMMENDED

Jet King Blow Torch (Kidde Mfg. Co., Inc., Bloomfield, N. J.) $1.95, postpaid, with single cartridge of LP gas. Extra cartridges, 2 for 49c. 5¾ in. long. Provided a useful flame for about 30 min. per cartridge.

BOOKS AND PAMPHLETS for the home handyman

Plans and patterns for things to make are available at various prices from McCall Corp., 230 Park Ave., N.Y.C.; Easi-Bild Pattern Co., Pleasantville, N. Y.; Popular Mechanics Press, 200 E. Ontario, Chicago 11; and American Home Pattern Dept., P. O. Box 296, Forest Hills, N. Y. Before buying plans for any project, the hobbyist should be sure he has the tools and know-how to complete it successfully.

A good book on use of power tools and planning a workshop is Power Tools for the Home Craftsman, by E. Hamilton, published by McGraw Hill, at $4.95. The Rockwell Mfg. Co., Delta Power Tool Division, has a series of 11 well-illustrated books, at $1 each, on use of the major power tools, things to make, and methods of finishing woodwork projects.

A pamphlet which will be helpful in every home is Tips to the Handyman-Hobbyist on How to Do It Safely. This pamphlet is available free, from the Home Insurance Co., 59 Maiden Lane, New York 8.

ADHESIVES

Polyvinyl-resin glues

These glues were tested and rated only as used for gluing wood. Glues based on polyvinyl resins are white liquids of about the consistency of heavy cream. They have a mild but distinctive acrid odor which is easily recognized. They are not suitable for use on outdoor furniture or anything likely to be exposed to high humidity for any extended period, nor can they be used on articles subjected to temperatures much above 100°F. Though joints made with these glues tend to "creep" under long-continued stress, the glues are suitable for jobs of many sorts common in the home, where wood is involved, as furniture construction or repair, toy repair, etc.

A. RECOMMENDED

Ad Hero Quick Bonding White Glue • Cementique • Elmer's Glue All • Franklin's Evertite Glue • Fuller's Resiwood • Handy Home • LePage's All-Purpose Glue • Magic Tite-Grip Clean White Glue • Rivit • Weldwood Presto-Set Glue • Will-hold White Glue.

B. INTERMEDIATE

Champ • Dab-N-Stick • Fast-Set Glue • Fuller's All-Purpose Adhesive.

C. NOT RECOMMENDED

Dunlap Quick Set Glue • SOBO (all-purpose).

Clear cements

These cements were tested and rated only as used for mending dishes of earthenware (the most common kind). Breathing fumes from clear, quick-drying cements, much used in model making, may be injurious to health, and such cements are highly flammable, as are the films left after drying. As these cements (and others) can be dangerous also if a spurt should get into the eye, special care should be used in starting up the flow from a tube in which the cement has hardened near the opening. Parents should warn young hobbyists of these dangers, emphasizing especially the hazard of breathing the vapors and the need for good ventilation in work areas.

Clear cements may be used for mending decorative articles of china, glass, and the like, but such repairs are not likely to be sufficiently strong and long lasting to permit the repaired articles to be used regularly for serving food or in other hard use.

A. RECOMMENDED

LePage's Household Cement • Seal-All.

B. INTERMEDIATE

Each of the following *B*-rated products gave a strong bond, which weakened somewhat after a period of soaking.

Ambroid • Duco Cement • DuPont All-Purpose Sealer • Franklin's Household Cement • Magic Crystal Clear Cement • Quick Mend Universal Mender • Testors Household Cement.

C. NOT RECOMMENDED

UHU All-Purpose Concentrated Glue.

▶ **REF:** BULLETIN, Feb. '58.+++

Automobiles and accessories

American and foreign 1958 automobiles • tires • safety belts • gasoline motor oils • cooling systems • anti-freeze • storage batteries • motor scooters

AUTOMOBILES FOR 1958

Astonishingly poor sales of American cars and sharply increased sales of small foreign cars can be attributed to the consumer's desire for better economy, and his sudden realization that prices for American cars have risen by $200 a year or so to levels that have become extremely burdensome for people of modest income. On top of this has been a deliberately confused pricing situation which has made it practically impossible to determine a car's true and fair price and the reasonable allowance on a car being traded in. The federal price-labeling law known as the Monroney Act, which goes into effect October 1, 1958, should eliminate "price packing" and fictitious discounts, but some think it may have the effect of setting up a resale-price maintenance system in the auto industry (uniform selling prices at all dealers, regardless of competitive conditions). Do not let the dealer talk you into buying a car which is loaded with a lot of accessories you do not want. Take your business elsewhere, if necessary. Remember that it's not the amount you have to pay *per month* that is important, but the *total sum* that must be paid, including charges for financing, interest, and insurance, to own the car free and clear.

Never sign a blank contract form to be filled in later, and be sure you read all the fine print. You do not have to finance the car or take out insurance with the dealer from whom the car is purchased. Usually financing and insurance can be obtained at lower cost from other sources.

If you shop around for a car and finally purchase from an out of town dealer, be prepared to find that your home town dealer may not be very effective in making good any defects that occur under the manufacturer's warranty. (He may not anyway, for that matter.)

SELECTIONS OF AMERICAN CARS

The great majority of American-made cars are open to criticism on some points of importance, such as excessive horsepower, excessive size, poor economy, extreme vulnerability to small accidental impacts, deficiencies in features determining safety, etc. Accordingly, it was felt that the best interests of our subscribers would be served by our selecting what are judged to be the most desirable cars in each price group, with no attempt to assign individuals ratings to the other cars of the group. For a fuller discussion of the cars tested, see the following 1958 BULLETINS: *Rambler,* Feb.; *Chevrolet, Ford, Plymouth,* March; *Buick, Pontiac, Studebaker,* April; *DeSoto, Dodge, Mercury, Oldsmobile,* May; *Chrysler, Cadillac,* June. Prices are factory-suggested list.

Price groups 1 and 2
CR's selections of preferred cars in these groups

First choice: *Chevrolet* or *Rambler*
Third choice: *Plymouth*
Fourth choice: *Ford*

Nowadays there is a growing interest in six-cylinder cars; for some people the choice between a six- or eight-cylinder car will be influenced by the somewhat lower price, about $100 less, of the six-cylinder cars and their somewhat more economical operation (better gasoline mileage and lower repair costs).

Price group 1 ($1874 to $2253)

Studebaker Scotsman 6, $1874 • Rambler DeLuxe 6, $2047 • Studebaker Scotsman 6 Flightomatic, $2063 • Ford Custom 300 6, $2119 • Chevrolet Delray 6, $2155 • Plymouth Plaza 6, $2169 • Rambler Super 6, $2212 • Rambler DeLuxe 6 Flash-O-Matic, $2247 • Studebaker Champion 6, $2253.

Price group 2 ($2256 to $2485)

Ford Custom 300 V-8, $2256 • Chevrolet Delray V-8, $2262 • Plymouth Plaza V-8, $2276 • Ford Fairlane 6, $2285 • Chevrolet Biscayne 6, $2290 • Ford Custom 300 6 Fordomatic, $2299 • Plymouth Savoy 6, $2305 • Rambler Custom 6, $2327 • Rambler Rebel V-8 Super, $2342 • Chevrolet Delray 6 Powerglide, $2343 • Plymouth Plaza 6 PowerFlite, $2349 • Studebaker Commander V-8, $2378 • Chevrolet Biscayne V-8, $2397 • Ford Fairlane V-8, $2409 • Rambler Super 6 Flash-O-Matic, $2412 • Plymouth Savoy V-8, $2412 • Ford Custom 300 V-8 Fordomatic, $2436 • Ford Fairlane 500 6, $2438 • Chevrolet Bel Air 6, $2440 • Plymouth Belvedere 6, $2440 • Studebaker Champion 6 Flightomatic, $2442 • Chevrolet Delray V-8 Powerglide, $2450 • Plymouth Plaza V-8 PowerFlite, $2456 • Rambler Rebel V-8 Custom, $2457 • Ford Fairlane 6 Fordomatic, $2465 • Chevrolet Biscayne 6 Powerglide, $2478 • Plymouth Savoy 6 PowerFlite, $2485.

Price group 3 ($2527 to $2742)

CR's selections of preferred cars

First choice: *Chevrolet* or *Rambler*
Third choice: *Plymouth*
Fourth choice: *Ford*

Rambler Custom 6 Flash-O-Matic, $2527 • Dodge Coronet 6, $2530 • Chevrolet Bel Air V-8, $2547 • Plymouth Belvedere V-8, $2547 • Ford Fairlane 500 V-8, $2562 • Rambler Rebel V-8 Super Flash-O-Matic, $2562 • Studebaker Commander V-8 Flightomatic, $2567 • Chevrolet Biscayne V-8 Powerglide, $2585 • Rambler Ambassador V-8 Super, $2587 • Ford Fairlane V-8 Fordomatic, $2589 • Edsel Ranger, $2592 • Plymouth Savoy V-8 PowerFlite, $2592 • Mercury Medalist, $2617 • Ford Fairlane 500 6 Fordomatic, $2618 • Plymouth Belvedere 6 PowerFlite, $2620 • Chevrolet Bel Air 6 Powerglide, $2628 • Dodge Coronet V-8, $2637 • Pontiac Chieftain, $2638 • Studebaker President V-8, $2639 • Rambler Rebel V-8 Custom Flash-O-Matic, $2677 • Buick Special, $2700 • Dodge Coronet 6 PowerFlite, $2710 • Mercury Monterey, $2721 • Plymouth Belvedere V-8 PowerFlite, $2727 • Rambler Ambassador V-8 Custom, $2732 • Chevrolet Bel Air V-8 Powerglide, $2735 • Edsel Pacer, $2735 • Ford Fairlane 500 V-8 Fordomatic, $2742.

Price group 4 ($2797 to $2998)

CR's selections of preferred cars

First choice: *Buick Special Dynaflow*
Second choice: *DeSoto Firesweep PowerFlite*
Third choice: *Dodge Coronet V-8 TorqueFlite*

Dodge Royal V-8, $2797 • Edsel Ranger Automatic Transmission, $2810 • Rambler Ambassador V-8 Super Flash-O-Matic, $2817 • DeSoto Firesweep, $2819 • Studebaker President V-8 Flightomatic, $2828 • Pontaic Super Chief, $2834 • Oldsmobile Dynamic 88, $2837 • Mercury Medalist Merc-O-Matic, $2843 • Dodge Coronet V-8 TorqueFlite, $2857 • Pontiac Chieftain Hydra-Matic, $2869 • Buick Special Dynaflow, $2920 • Mercury Monterey Merc-O-Matic, $2947 • Edsel Pacer Automatic Transmission, $2953 • Rambler Ambassador V-8 Custom Flash-O-Matic, $2962 • DeSoto Firesweep PowerFlite, $2998.

Price group 5 ($3017 to $3425)

CR's selections of preferred cars

First choice: *Oldsmobile 88 Hydra-Matic*
Second choice: *Oldsmobile Super 88 Hydra-Matic*

Dodge Royal V-8 TorqueFlite, $3017 • Dodge Custon Royal V-8, $3030 • Pontiac Super Chief Hydra-Matic, $3065 • Oldsmobile Dynamic 88 Hydra-Matic, $3068 • Pontiac Star Chief, $3071 • DeSoto Firedome, $3085 • Oldmobile Super 88, $3112 • Chrysler Windsor, $3129 • Mercury Montclair Merc-O-Matic, $3236 • Dodge Custom Royal V-8 TorqueFlite, $3250 • DeSoto Firedome PowerFlite, $3265 • Pontiac Star Chief Hydra-Matic, $3302 • Buick Century Dynaflow, $3316 • Oldsmobile Super 88 Hydra-Matic, $3343 • Chrysler Windsor TorqueFlite, $3349 • Edsel Corsair Automatic Transmissin (4-door hardtop), $3425.

Price group 6 ($3583 to $3944)*

CR's selections of preferred cars

First choice: *Oldsmobile 98 Hydra-Matic*
Second choice: *Buick Super Dynaflow*

DeSoto Fireflite, $3583 • Edsel Citation (4-door hardtop), $3615 • Buick Super Hardtop, $3789 • Chrysler Saratoga, $3818 • Oldsmobile 98, $3824 • Mercury Park Lane (4-door hardtop), $3944.

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* Automatic transmissions are standard equipment on all cars in this price group.

Price group 7 (over $4000)*

No first choice is offered in this group, as only the *Cadillac 62*, by far the largest selling car of the 10 cars listed, was tested. Important from the standpoint of saleability and turn-in value is the fact that in 1957 Cadillac sold about four times as many cars as *Imperial* or *Lincoln.*

Chrysler New Yorker, $4295 • Buick Roadmaster Hardtop, $4667 • Cadillac 62 Hardtop, $4891 • Imperial, $4945 • Lincoln Capri, $4951 • Buick Limited Hardtop, $5112 • Lincoln Premiere, $5565 • Lincoln Continental Mark III, $6072 • Cadillac 60, $6232 • Cadillac 75 (8-passenger sedan), $8460.

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* Automatic transmissions are standard equipment on all cars in this price group.

FOREIGN ECONOMY CARS and the Rambler American

For fuller reports on these "economy" cars, see Consumer Bulletin for November 1957, January 1958, and July 1958. Miles per gallon figures are of course approximate; they are based on a constant speed of 50 miles per hour unless otherwise noted. Miles per gallon on the road will be roughly 85 percent of the figure given.

Price group 1 (under $1200)

B. INTERMEDIATE

Isetta 300 (Distributed by Fadex Commercial Corp., 487 Park Ave., N.Y.C.) $1048 delivered N.Y.C., including heater. Made in Germany. Convenient for short runs, not a car for highway travel. 51 m.p.g. at 45 m.p.h.

B—

Heinkel Cabin Scooter (Distributed by East Land Motor Corp., Brooklyn 34, N.Y.) $1045 delivered N.Y.C., including heater. Made in Germany. 75 m.p.g. at 40 m.p.h. Somewhat like the *Isetta* in appearance, but the *Isetta* is considered to be a much better buy.

Price group 2 ($1500 to $1750 p.o.e.)

A. RECOMMENDED

Simca Aronde 1300 4-door sedan (Simca, Inc., 445 Park Ave., N.Y.C.) $1595 p.o.e. (port of entry). Heater, $50. $1645 with heater, delivered N.Y.C. Made in France. 31 m.p.g. Judged first choice in this price group.

Renault Dauphine 4-door sedan (Renault of France, 270 Park Ave., New York 17) $1645 p.o.e. Heater is standard equipment. $1745 delivered N. J. Made in France. 38 m.p.g. Judged second choice in this price group. Where winter temperature may go to zero or close to it, avoid buying any *Dauphine* made before the larger generator and regulator were introduced in about March 1958. We advise against purchase of the *Dauphine* with automatic clutch mechanism.

Volkswagen 2-door sedan (Distributed by Volkswagen of America, Inc., Englewood Cliffs, N. J.) $1545 p.o.e., including heater (judged seriously inadequate, if not almost ineffective in near-zero weather). $1595 delivered N. J. Made in Germany. 37 m.p.g. Judged third choice in this price group. *VW's* have maintained their turn-in values pheomenally well, far better than any other car.

Morris Minor 1000 2-door sedan (Distributed by J. S. Inskip, Inc., 304 E. 64 St., N.Y.C.) $1648 p.o.e. $1715 with heater and white-wall tires, delivered N.Y.C. Made in England. 41 m.p.g.

B+

Ford Prefect D.L. 4-door sedan (Distributed by Ford Motor Co., Jersey City, N.J.) $1639 p.o.e. $1679 with heater, delivered N.J. (A 2-door model, called the *Anglia,* is available at $100 less.) Made in England and Ireland. 31 m.p.g.

Metropolitan 1500 2-door Hardtop (American Motors Corp., Detroit 32) $1567 p.o.e. Heater, $69. Radio, $61.50. Made in England. Delivered price in N.J. with radio, heater, and white-wall tires with which all *Metropolitan* cars are equipped, $1775. 26.5 m.p.g.

Price group 3 ($1775 to $2500 p.o.e.)

A. RECOMMENDED

Vauxhall Victor 4-door sedan (General Motors Corp.; distributed by Pontiac dealers) $1957.50 p.o.e., including heater. $1987.50 delivered N.J. Made in England. 32 m.p.g. First choice in group.

Opel Olympia Rekord 2-door sedan (General Motors Corp.; distributed by Buick dealers) $1957.50 p.o.e., including heater. $1987.50 delivered N.J. Made in Germany. 32 m.p.g. Second choice in this price group.

Volvo PV-444 (Volvo Distributing Inc., Fort Lee, N.J.) $2170 p.o.e., including heater. Made in Sweden. 28.3 m.p.g. Third choice in this price group.

Borgward Isabella (Distributed by Fergus Imported Cars, Inc., 1717 Broadway, N.Y.C.) 2-door sedan, $2495; station wagon, $2685 (p.o.e.). 30 m.p.g.

B. INTERMEDIATE

Hillman Minx 4-door sedan (Rootes Motors, Inc., 505 Park Ave., New York 22) $1849 p.o.e. $1906 delivered N.Y.C., including heater. Made in England. 30 m.p.g. The non-standard positions of the manual shift lever are confusing; it will take time to get used to them, and to avoid danger of an accident from a mistake in shifting.

Rambler American 2-door (American Motors) De luxe model, $1789; super model, $1874 (factory suggested prices). Overdrive, $102.50. 23 m.p.g. in overdrive. (M.p.g., poor in comparison with light foreign cars.)

Saab 93 2-door sedan (Distributed by Saab Motors, Inc., 130 W. 57 St., New York 19) $1895 p.o.e. Made in Sweden. Heater and white-wall tires are standard equipment. $1995 delivered Pa. Electric clutch, $100. 34 m.p.g.

TIRES

Brand names of tires are in such confusion, deliberately created by tire manufacturers, that it is practically impossible for the consumer to tell whether he is being offered a first-, second-, or third-line tire. For example, the Federal Trade Commission has charged that Firestone Co. sold second-line tires under the names *Firestone Super Champion* and *Firestone De Luxe Super Champion;* yet obviously these names imply that they are top-grade tires, higher in quality than *Firestone DeLuxe Champion* (which is in fact a "first-line" "100-level" tire). The F.T.C. is attempting to bring some order into the current chaos of tire names and grades.

Tire life in miles is likely to be considerably lower on the cars now being produced, due to the higher horsepower, which naturally goes with more slippage of the rear wheels in starting and accelerating, and to the 14-inch wheels. Fleet owners report that adoption of the 14-inch wheels has brought about a 20 percent reduction in tire mileage.

Tests made by the Bureau of Public Roads have shown that stopping distances of new tires may differ by as much as 30 percent between brands. If tires are not all purchased at one time, they should be bought and installed in pairs of the same brand on opposite wheels, as tires of different ages, brands, and condition pull unevenly and wear out faster, may cause skidding and an accident by uneven slippage on a wet road.

The manufacturers' recommended inflation pressure (24 pounds, 26 pounds, etc.) is a *minimum* which should apply only when the tire is "cold" (at existing atmospheric temperature). Tires rated at 24 pounds should be at a minimum of 29 pounds when "hot." Underinflation causes tires to run hotter and deteriorate faster. Inflation 2 to 4 pounds above the nominal value lengthens tire life, increases safety in driving emergencies, but gives a harder ride and increases the likelihood of damage from cuts and bruises. Even a moderate front-end misalignment produced by the bump of a tire against a curb or other obstacle can cause rapid and uneven wear. So far as practicable, keep tires away from heat, light, oils, grease, copper, brass, or rusty metal, and excessive dampness. Nylon cord tires on a car that stands for some time, particularly in the wintertime, develop flat spots which cause marked thumping of the tire, particularly in the larger sizes, for several miles until the flat spots work out. Rayon tires do not present this problem.

Shifting tires will equalize the wear and extend the time that the car can run on its original five tires, *but* all the tires will wear out at about the same time and so tend to require a large outlay of money at one time to replace them. So far as practicable, tires should be purchased and installed in the winter instead of the summer.

Third-line tires are priced about 45 percent below first-line tires; second-line tires, 30 percent. CR does not recommend purchase of any "super" grade or extra-high-priced tires, as they do not furnish anything like the extra value charged for in the high premium for them and they are often less satisfactory than the standard "100-level" tires.

Tubeless tires

The tubeless tires that all new cars now have as standard equipment are not punctureproof; if the tire is pierced by a nail, a slow leak occurs and the tire must be repaired. Another kind is made punctureproof by the inclusion of a puncture sealant on the inside of the tire, which adheres to the puncturing object and prevents the air from escaping from the tire. When the nail or other object causing the puncture is removed, the sealant is forced into the hole (if it is not too large) by the air pressure. Such tires should be inspected for nails, etc., periodically, as the puncturing object may considerably damage the tire before leakage is noticed. Many have found that when a tubeless tire has been punctured it cannot be permanently repaired.

Serious tire unbalance has been a common trouble with tires containing puncture-sealing compounds. They present other difficulties, too.

Careless servicemen using tire irons and hammers without due care can permanently damage a tubeless tire. It is best to have your tire mounting and repair done only by expert, careful workmen.

Special tires for winter driving

The best specialized tires do not provide advantages over conventional tires sufficient to warrant less care or caution when driving on slippery surfaces; stopping distance, at best, on glare ice will be eight times as great as on dry concrete; *tire chains must be used* for severe snow and ice conditions.

So-called "reinforced" tire chains on glare ice are better than natural rubber tires by 60 percent in stopping ability and show a gain of 400 percent in traction ability.

For maximum stability when slowing down and stopping on glare ice, it is best to "pump" the brakes. Get the feel of the road by applying brakes carefully on a trial basis at a point where they are not needed, on a winter day when roads are slippery.

The choice of the proper snow tire is a complex problem. CR considers that one of the best, if not the best, designs available is that of the *Firestone Town and Country*. While giving good road-holding ability on snow, this tire has the unusual property of being relatively free from road noise on a bare road surface. Another brand that is widely used and has given good performance is *Goodyear Suburbanite*.

Retreaded and recapped tires

Top quality rebuilt tires are now giving satisfactory performance. However, some rebuilt tires are poor, because low-grade material with large amounts of filler substances (adulterants) is being used in order to cut costs.

Does it pay to have a tire retreaded? The answer depends first on price. A top-quality full recap job can be obtained, with the customer providing the tire, for about half the list price of a new "first-line" tire. The saving would seem to be worth while provided the tire to be recapped is in good condition, with no breaks in the sidewall, or cords, no radial cracks, if the rubber is good, and a 100 percent "cold-rubber" recap is used. (A casing that has been repaired should not be recapped.)

Do not buy a retread from a dealer with whom you are not acquainted and who does not have a good reputation in your community. Some retreads may present actual danger of failure at even moderate speeds. It is best not to order retreads unless the dealer will provide a written guarantee of satisfactory service for a minimum of 12 months (or 10,000 miles) against defects in material and workmanship.

▶ **REF:** Bulletin, Dec. '53+++, Oct. '54+.

SAFETY BELTS

In certain types of accidents, properly constructed seat belts have some value, while in other types of accidents (e.g., head-on collisions at moderate to high speeds, when a sports car overturns, or when a car of any type catches on fire) they have no useful effect, may even greatly increase the danger. A shoulder harness is far more effective, but experience shows that there are few who will take the trouble and undergo the discomfort of using one.

Seat belts are considered more desirable for rear-seat passengers; belts help to prevent them from being thrown forward in a collision and in that way help to decrease the hazard to occupants of the front seats.

Manufacturers have used the promotion of seat belts as a way of distracting their customer's attention from the many faults of automobile design (easily and cheaply corrected, as a rule) that greatly (and needlessly) increase the danger and degree of injury in a crash or collision.

GASOLINE

Under the present conditions, the cost and time of making tests on gasoline do not appear warranted, and the differences from the consumers' standpoint of the products of well-known refining companies are hardly significant.

Recent tests by a state laboratory showed that out of over 4000 samples, only 26 samples (less than 1 percent) of well-known brands failed to meet specifications, and the differences that were found were of minor importance. We have no reason to believe that cut-price or "off-brands" of gasoline are deficient in any way that would cause harm to a car. Quality of gasoline varies from season to season, intentionally, but at any given period the quality is likely to be pretty uniform.

CR recommends the use of regular-grade gasoline in preference to premium and super-premium grades, provided the regular grade can, by adjustment of the spark advance, be used without serious pinging or knocking of the engine. Some late-model cars with high-compression engines require gasoline of very high octane rating, and some cars that ran satisfactorily on regular gasoline when new may require a gasoline having an octane number 5 to 15 points higher to prevent knocking, as carbon accumulates in the engine.

There is no point to using a fuel with a higher octane number and at a higher price than the engine requires, as it will give no improvement in performance. (It is said that about 40 percent of car owners waste money by buying higher octane gas than their engine requires.) The use of high octane fuels results in faster corrosion of mufflers. Disregard advertising claims that a gasoline has exclusive and important advantages or super-performance not found in other brands.

Gasoline dopes and "gas-saving" gadgets

It is a waste of money to buy fuel dopes to be added to the gasoline or any of a variety of mechanical gadgets, special spark plugs, "super charging" devices, etc.

New devices and variants of old "dopes" and devices are constantly being offered. *Often the only really new features are the brand names and the claims that are made.* If the consumer has any reason at all other than advertising claims to believe that a product has merit, *he should ask for written proof of performance* (*not* testimonials). If the requested reports are not furnished, or if, when examined by a person qualified to consider technical data, they do not prove what is claimed or do not represent competent, careful, responsible work, by *technically qualified* engineering experts whose signatures appear and whose names and professional qualifications are shown, and who are members of appropriate professional or learned societies, the consumer will be justified to assume that the devices or chemical substances for which the claims are made are in the "patent-medicine" class and almost certainly will not give the advertised advantages or performance.

MOTOR OILS

Two systems of classification of oils are in use at the present time. Originally, when additive oils were first introduced, oils were classed as *Regular, Premium,* and *Heavy Duty.* The new system classifies an oil with respect to the kind of service for which it is intended: *Service ML* (light service), *Service MM* (moderate service), and *Service MS* (severe service).

Service ML or *Regular* oils are for engines having no special lubrication requirements (such, for example, as are imposed by hydraulic valve lifters) and engines that are operated at moderate speeds under favorable conditions.

Service MM or *Premium* oils contain oxidation and bearing-corrosion inhibitors and are for engines not having special lubrication requirements but operated at high speeds and under heavy loads.

Service MS or *Heavy-Duty* oils contain, in addition to bearing-corrosion inhibitors, a *detergent* additive; these are for engines having hydraulic valve lifters or other parts sensitive to deposits, and for all engines operating under severe conditions (short runs in cold weather, or driving for long stretches at high speeds). *Service MS* oil is suitable for use in any new car for any type of driving; it is the only type now recommended by many manufacturers for their new cars.

If you own a new or recent-model car, use a *Service MS* (heavy-duty) oil. In an older car, *Service MS* oil may be unnecessary if the car is operated under normal conditions. If the engine is worn and uses much oil, use of a cheaper oil may often be warranted.

If a used car is bought, or it is decided to change from *Service ML* (regular) oil to *Service MS* (heavy-duty) oil in a car that has been run a considerable number of miles, the first filling of a heavy-duty oil should be run a *maximum* of 500 miles and then drained, and the oil filter element replaced (if there is a filter). This will lessen the possibility of damage being caused if the oil lines become clogged with old deposits that may be loosened within a short period by the heavy-duty oil. In all cars, the oil level should be maintained in the normal range; avoid running with oil above or below the normal filling level.

Multi-viscosity oils combine the properties of several grades, for example, SAE 5W-20, SAE 10W-30. Evidence available to CR indicates that it will be best where practicable to use oils which cover only a single viscosity range, except in places where very low temperatures may occur at times. (A very "light" wide-range oil such as SAE 5-20 is then to be preferred.)

The average consumer will save money by avoiding the various unusual or "specialty" lubricants, no matter what is claimed for them. There is no need to pay a premium price for supposedly extra-quality oil having special (usually completely undefined) properties. Use of any special break-in oil or special additive oils is hardly warranted *unless in the unusual circumstance that the oil has been tested and approved by the particular car manufacturer and is recommended in writing by him for use in his car of a given year and model.* On this question the opinion of a serviceman or dealer should not be sought or followed, unless he is able to show that the car manufacturer has recommended a particular additive or specialty oil for the circumstances of your case. In purchasing motor oil, choose a brand of the SAE number (viscosity) recommended by the car manufacturer in his instruction book, and marketed by one of the big, widely-known oil companies. Do not mix brands or types of oil, as oils having different additives may not be mutually compatible.

The following ratings are based on results of tests made recently by North Dakota's state government laboratories. Ratings are by Consumers' Research and are based on viscosity index (one of the most important tests on lubricating oil). No tests were made for the effects of the various additives now used in motor oils. Omission of any brand may mean only that data on it were not available and does not imply an unfavorable rating.

A. RECOMMENDED

Alemite. 20-20W.

Champlin. 10, 20, 30.

Conoco Super. HD-10W.

Golden Shell. 10W, 30.

Havoline. HD-10W, HD-20-20W, HD-30.

Hyvis. 10W, 30, HD-10W, HD-20-20W, HD-30.

Kendall. HD-20-20W.

Mobiloil. HD-10W, HD-20-20W, HD-30.

Opaline. 20-20W.

Pennzoil. 10W, HDM-10W, HDM-20W, 30, HDM-30.

Permalube. HD-10W, HD-20-20W, HD-30.

Phillips 66. 10W, HD-10W, 20-20W, 30.

Phillips Prem. 10W, HD-20-20W, HD-30.

Purol. HD-10W, 20-20W, HD-30, 30.

Royal Triton. HD-10W, HD-20W, HD-30.

Shell. HD-20-20W.

Shell X 100. 10-10W, HD-30.

Sinclair Penn. 10W.

Skelly. 10W, 20.

Stanolube. HD-M-10W, HD-M-20-20W, HD-M-30.

Texaco. 10W, 20-20W.

Tydol. HD-10W.

Tydol-A. HD-20-20W.

Valvoline S-W. 10W, 20W.

Veedol. HD-10W, HD-20-20W, HD-30.

Ward's Vitalized. HD-10-W, HD-20-20W.

Wolf's Head. HD-10W, 30.

Changing of crankcase oil

About half the new cars are designed to run 4000 miles or more between oil changes. Changing oil every 1000 miles, formerly much recommended, is now no longer customary, or urged by car manufacturers.

As a general principle, it is not necessary under favorable driving conditions (that is, with no great amount of stop-and-go driving, or driving at high speeds, or on dusty roads) to change the oil in the crankcase frequently provided that oil is added as required to keep the proper level. For the average driver, changing oil twice a year, before cold weather in the fall and before warm weather in the spring, should be sufficient.

With modern detergent oils, the color of the oil is not a good indication of its condition, for a *Service MS* or heavy-duty oil normally looks dirty in a short time, as it is intended to pick up soot, carbon, etc., and hold it in suspension.

With drivers whose travel in winter is mostly over short distances at slow speed (physicians in city practice, for example), it may be in order to change the oil every 3 months, or about every 500 miles (whichever occurs first), in order to minimize sludging and corrosive wear. With short-run driving, the rate of wear is increased by corrosion, sometimes to a great extent. To the extent to which it is practicable, an engine should be allowed to run until it gets fully heated up.

Oil consumption

Engines must use some oil if their parts are to be properly lubricated. One need not be concerned if a typical American six- or eight-cylinder car uses one quart for every 600 to 1200 miles for the first 15,000 miles; this is about normal (much less for small European cars). Oil consumption per 1000 miles may increase about 50 percent at the end of the next 15,000 miles. Oil consumption per mile, like gasoline consumption, increases rapidly with increasing speed.

Products are offered that are supposed to seal leakage between piston rings and the walls of automobile cylinders. There is no material which can be put into an automobile engine which will act effectively to prevent piston slap or take up the clearance between cylinder walls and the pistons, or prevent cylinder and piston wear. Neither a thick "goo" to be injected into cylinders through the spark-plug openings to give "the effects of a ring and valve job" nor tablets or pills dropped into the fuel tank or engine cylinders can be even a remote substitute for needed mechanical repairs. If such methods were effective, manufacturers and repair shops would use them as cheap, profitable substitutes for costly machining operations.

Oil additives and related products

The claims made for products which are sold to be added to the engine oil and are said to increase power, acceleration, and gas mileage, decrease wear and corrosion, decrease noise, etc., are to be discounted as almost 100 percent unreliable and unprovable. (The claims are commonly vague and indefinite, and in a practical sense impossible to prove or disprove.) *Disregard testimonials for automotive products and specialties, from whatever source they come. The only evidence that need be given any weight will be in the form of reports by professional experts of standing working in known, qualified laboratories.* If the product cannot have its performance shown by standard technical means in a laboratory of repute, you are safe in assuming that it cannot give a useful improvement in performance. A car owner should not buy and use proprietary oil additives. It is much safer (and cheaper) to buy an oil *with the additives blended in by the oil refinery* than to add a high-priced concoction sold on the basis of unproven and often irrelevant or misleading claims. The heavy-duty oils produced by reputable oil companies have all the necessary and desirable additives blended in during processing. The addition of another additive to the oil by the consumer may result in a harmless mixture at best, or a seriously damaged engine at worst. By way of example, some additives may cure valve lifter trouble in one engine, and yet increase wear and cause trouble in another make or type of engine.

Note, too, that some automobile manufacturers advise against the use of any of the special oil additives in their cars. If damage to the engine should occur through the use of one, the responsibility and loss will be yours. Give no weight to claims of satisfaction or money-back. Consider the problem of trying to prove that the product did not perform as claimed to the satisfaction of the manufacturer or promoter who is determined to keep your money if he possibly can.

Tests on *Wynn's Friction Proofing Oil* showed certain advantages and a number of offsetting disadvantages. Oil treated with *Bardahl* did not show significant advantages, in corresponding tests, over ordinary oil, and some undesirable properties were added.

Alemite CD-2 Concentrate differs basically from most "patent medicine" additives in that it apparently consists of fairly concentrated additives of the type used by the oil industry in *MM* and *MS* oils, but tests indicated no significant advantage to the use of *CD-2* over a good heavy-duty motor oil which already contains the desirable additives, and there are disadvantages of cost and inconvenience in buying the additives as a separate item.

Top-cylinder lubricants or valve oils

There is no justification for the use of special, high-priced top-cylinder lubricating oils except by an automobile dealer acting strictly *under written instructions by the manufacturer of the car* for a new car's 500-mile break-in period.

▶ **REF:** BULLETIN, June '50++++ (additives for gasoline and oil); Sept. '51++++ (crankcase oil additives); May '53+ (special oils and dopes); Apr. '54++ (motor oil additives, "Moly" and CD-2); Oct. '54++ (modern oils); Feb. '57 ("What is high octane gasoline?").

OIL AND AIR FILTERS

A good oil filter will, if the element is replaced frequently enough, remove grit, dirt, and metal particles from the oil and help to reduce engine wear. In one test under normal conditions (in city-area driving), it was estimated that about 50 percent of engine wear could be attributed to abrasion by oil-borne particles, 45 percent to low temperature corrosion (usually the result of short runs and the engine not warming up fully before the stop), and 5 percent to other causes. To maintain the effectiveness of the filter, replace the element or cartridge at regular intervals, usually every 5000 to 6000 miles or according to the manufacturer's directions.

The full-flow oil filter as supplied on several late model cars is considered preferable to the partial-flow type.

On some new cars, oil filters are hidden in such out-of-the-way places that, according to one trade magazine, service station personnel just wipe the casing off and charge for a filter replacement because it is too much trouble to change it.

Grit and dirt are drawn into the engine with the air needed for combustion; thus it is important that the air filter, whether it is of the oil type or the newer dry-type paper filter, be maintained at top efficiency. Cleaning of the dry-type paper filters must be done with care to avoid rupture of the paper; a break in the paper, though not readily detected, can render the air filter useless.

Filter refills

The refills listed are intended to reduce the cost of maintaining a filter. (The usual throw-away element costs about $2 and cannot be re-used.)

B. INTERMEDIATE

Filterall Lifetime Filter (Engine Products Mfg. Co., 5801 E. Beverly Blvd., Los Angeles 22) $12.95 for complete unit, $6.95 for kit to convert usual-type filters. Similar "permanent" filters are sold under various names by other companies. Filter element is made of porous bronze which does not require replacement, but does require removal for cleaning at about 2000-mile intervals, or in some cases much oftener if the engine has considerable sludge accumulation.

Retlif Filter Adapter (Retlif Corp., 1239 N. Highland Ave., Los Angeles 38) $3.50. Consists of two plates and spring which fit a roll of toilet paper; the combination is used in place of the regular refill in oil filters of automobiles. Adapters are available to fit most makes of filters.

"ACID NEUTRALIZER"

C. NOT RECOMMENDED

Various protective devices and gadgets alleged to prevent engine deterioration caused by corrosion, now being very actively marketed, including:

Magna-Power (The Johns Mfg. Co., Dunellen, N.J.) $2.95. In laboratory tests, the device was not effective in neutralizing the acids that might cause engine corrosion, as it was claimed to be; it is believed not to have the value claimed in increasing power and speed and preserving engine life.

CARBON AND VARNISH REMOVAL

The normal and probably best way to remove carbon is to remove the cylinder heads so that the affected parts can be examined and cleaned by scraping, wire-brushing, etc.

Solvents introduced into the engine via the crankcase or air intake which are supposed to remove carbon and other deposits may do harm, and cause engine troubles subsequently. The fact that the material will dissolve some varnish in a "demonstration" does not mean that it will clean an engine safely; some solvents are highly corrosive.

In another method, used for several years with success on some late-model high-compression engines, a special machine blows a cleaning material (such as ground walnut shells) into the cylinders through the spark plug holes. The impacts loosen the deposits; the machine sucks out the residues.

C. NOT RECOMMENDED

All carbon removers designed to be added to the gasoline. Some actually increase carbon deposit.

Liquid carbon, varnish, and sludge removers injected into the cylinder or introduced through the air intake and carburetor, including acetone, kerosene, and various proprietary products. See also "Oil additives and related products," page 124; carbon-removal claims are often made for such products.

COOLING SYSTEMS

The life and efficiency of the cooling system of an automobile depend very directly upon the care given by the owner and the following of correct maintenance procedure. The cooling system should be drained and flushed in the spring when the anti-freeze is removed, after which a rust inhibitor (all or most all automobile dealers carry a suitable rust inhibitor liquid in their stock rooms) is added to the water. The system is drained and flushed again in the fall before anti-freeze is added.

The draining and flushing operation should consist of filling with water and draining the radiator and engine jacket at least three times to dilute and remove the muck. At the same time that the cooling system is drained, hoses and hose connections should be inspected and replaced wherever necessary to prevent leakage later.

The anti-freeze that is removed in the spring should be discarded and fresh anti-freeze added in the fall for sure protection of the cooling system.

Rust inhibitors

The inhibitors listed below under *A. Recommended,* except *Du Pont Acid and Rust Inhibitor,* are of the emulsion type. Prices charged for this type of inhibitor ranged from 50 cents to $1 for from 8 to 16 fluid ounces, but all contained about the same amount of active material.

A. RECOMMENDED

Esso Radiator Rust Preventive • Ford Rust Inhibitor • Solder Seal Improved Water Pump Lubricant and Rust Inhibitor • Bowes Seal Fast Concentrated Radiator Rust-Rout • Du Pont Acid and Rust Inhibitor • Improved Original Rustbuster "Auto-Radiator Treatment" • Mopar Radiator Rust Resistor • Rust Master "Improved" • Sunoco Rust Resistor • Permatex Water Pump Lubricant and Radiator Anti-Rust • Zecol Cooling System Conditioner.

B. INTERMEDIATE

Mac's No. 13 • Mobile Hydrotone • Warner Cooling System Protector.

Cleaners

A rust inhibitor does not clean a radiator nor does it remove rust from the system. Special radiator cleaners are used for that purpose. It is important to drain, refill, and flush three times a radiator system in which a cleaner was used.

A. RECOMMENDED

Prestone (National Carbon Co.) $1.25 for 16 oz. cleaner, 2 oz. neutralizer. Chiefly oxalic acid (poisonous).

Electrolytic anti-corrosion devices or "radiator protectors"

There are a number of devices claimed to stop scale formation or remove scale and prevent corrosion in automobile radiators by some sort of electrolytic action. They are commonly described in pseudo-scientific terms; they are not correctly designed to work as claimed. Money spent on them is wasted; indeed some may even cause an increase rather than a decrease in corrosion.

ANTI-FREEZE

Methanol (methyl alcohol) anti-freeze will give trouble-free protection all winter at about one third the cost of ethylene glycol (so-called permanent) anti-freeze. Many people buy ethylene glycol anti-freeze under the mistaken impression that it can be used throughout the year or can be saved in the spring for re-use in the next winter without causing clogging or rusting of the radiator and other parts of the system. Sometimes this will do no particular harm; in other cases it may. It is not safe to re-use any type of anti-freeze. No additive is available that the consumer can buy to restore any anti-freeze to its original condition and so render it safe for continued use in a car.

Anti-freeze solutions should never be left in the radiator in the summer; the development of rust and corrosion may take place 30 times as fast during high-speed warm-weather driving as in the winter.

A recent survey disclosed one out of every five cars has a leaky radiator problem; a good many of these cases are believed to be caused by failure to drain the anti-freeze in the spring. Others may be caused by failure to use a rust inhibitor during the summer season.

Evaporation loss of alcohol anti-freeze is no problem with the newer cars that have pressurized cooling systems.

Propylene glycol and mixed-glycol-base anti-freeze offer satisfactory protection to the cooling systems but have the disadvantage that they are difficult to measure with a standard hydrometer for the protection afforded. For this reason anyone wishing to use a glycol anti-freeze will be wise to give preference to a product based on ethylene glycol.

Ratings of the anti-freezes which follow are by CR, based mainly on chemical analyses published by the North Dakota State Laboratories Department, and are cr57.

Methanol

A. RECOMMENDED

Ace Super Methanol, Allstate Durozone, Allstate Methanol, American Motors Methanol, Barco Super, Buick Methanol, Coast to Coast Standard, Conoco Methanol, Double C Brand, Durone, Economee Methanol, Firestone Frigitol, Flying A Methanol, FoMoCo Methanol, General Motors Methanol, Goodrich Methanol, Goodyear Super, International Harvester, Koldpruf Methanol, Mercury Methanol, Mobile Freezone Methanol, MoPar Methanol, Norway, Phillips 66 Methanol, Pure Sure, Shell Super, Sinclair, Standard Super, Super Pyro, Trek, Varcon Bonded, Wards Ice-Guard, Zerone.

Glycol

Ethylene-glycol-base anti-freeze solutions should be used for cars in which a higher temperature (180 degree) thermostat has been installed to increase the output of the car's heater; for cars driven often in heavy city traffic with frequent stops and starts; and for cars used in mountain driving, particularly when this may occur on relatively warm days.

To protect a 20-quart cooling system to −30° F, approximately 10 quarts of any one of the following anti-freezes will be required.

A. RECOMMENDED

For one season's use only

Allstate, American Motors, Atlas Perma Guard, Buick Non-Evaporating, Cities Service, Coast to Coast, Conoco, Durex, Firestone Frigitone, Firestone Super, Flying A, FoMoCo, Freezite, General Motors, Goodrich, Goodyear, International Harvester, Lincoln, Mobil Permazone, MoPar, One Fill, Peak, Phillips 66, Prestone, Pyro, Shellzone, S & P (Studebaker-Packard), **Skelly, Texaco P. T., Varcon, Wards, Zerex.**

▶ **REF:** Bulletin, Nov. '56.+++

Petroleum distillate

C. NOT RECOMMENDED

Chem-A-Cool, Freeze Proof, Husky, Igloo, Mo-Guard, Neva-Freeze, Never Freeze, Nev-R-Freeze, No-Boil, No-Freeze, Safas, Safety-Zone.

Calcium or magnesium chloride

C. NOT RECOMMENDED

Alcotex, All-Winter, Antarctic, Anti-Frost, Artic Circle, Bird Antarctic, B-Lo, Bond (Top Line), Bro-Son, Cascade, Chromax-5, Ever-Flo, Flexo, Fre-Zex, Frezpruf, Frigid, Fridgizone, Frozone, Goal, Gold Seal, Iceberg, Kant Freeze, Kantfreeze, Kant-Leak, Lo-Temp, Lo-Zone, National, Nationwide Non-Freeze, New Emproved Perment, No Corrofreze, North Star, Nyla, Owens Permanent Type, P-60, Paradox, Permatection, Permatone, Permex, Polar Bear, Polar Flow, Polar Zone, Pre-Tekt, Pro-Tex-Em, Security, Timberline, V-o, Wayland, Wonder-Solve, Zero Flo, Zerotone, Zone.

Other types

C. NOT RECOMMENDED

Honey, glucose, and sugar solutions.

STORAGE BATTERIES

Before you accept delivery of a new 6- or 12-volt battery, have the electrolyte in each *separate cell checked with a battery tester* to obtain an indication of its state of charge. Do not purchase any battery in which one of the cells shows a reading of specific gravity greatly different from that of the others or in which any cell shows a reading below 1.230-40 at 80 degrees (preferably 1.260 or thereabouts). Unfortunately, battery capacity (and the specific gravity reading) decreases as the weather gets colder. It is therefore advisable not to operate the starter too long at a time in cold weather. Give the battery a minute or two to recuperate and try again if the engine doesn't start on the first try or two. If starting is chronically difficult, take the car in for service.

With the new 12-volt batteries, it is particularly important to have the specific gravity of the electrolyte checked regularly with a hydrometer or a voltmeter and especially in the wintertime if you think the battery may be near the end of its life. The new 12-volt batteries do not give as much warning of impending failure as the 6-volt batteries do.

The guarantee on a storage battery should be based upon the probable average life of the battery in actual use. Unfortunately for the consumer, a number of unscrupulous promoters of automobile batteries have issued ridiculously long and quite ineffective guarantees as an easy way to get business that would otherwise go to old line reputable manufacturers who made conservative claims. (This type of competition has impelled some makers of good brands to extend their guarantees to an unwarranted time.) We advise strongly against buying any battery for which a phenomenally long service life is claimed.

If a battery of reputable make fails before its guarantee expires, the manufacturer will grant an allowance based upon the number of months the guarantee period has yet to run. This allowance will be applied against the purchase of a new battery of the same make. By this method, the manufacturer is assured of repeat business at his regular, non-discount price, and the consumer can figure on a set monthly figure for battery expense which is found by dividing the initial cost of the battery by the number of months for which it is guaranteed.

Advertising in various popular magazines and by mail promotes a variety of batteries as being self-charging, having a very long life or extraordinary recuperative ability, or as being similar in performance, construction, and effect to nickel-cadmium or alkaline-type batteries. Some are claimed to contain cadmium, silicon, or some other "magical ingredient" as a constituent. Many of them are advertised as carrying an alleged guarantee for 6 to 10 years or even for "the life of the car." *Life-Time* (with a 6-year guarantee) and *Life-Long* and *Silicon Waterless* (both claimed to have 10-year guarantees) are examples.

Essentially, various new batteries for which impressive claims are made are only run-of-the-mill lead-acid batteries, of mediocre rather than superior quality. If some assertions made for the product seem impossible, or absurd, or pseudo-scientific in terms, it is best to assume that much of the remaining material is of a like nature and very likely just "dreamed-up" by the promoter or his ad-man. Genuine nickel-cadmium alkaline batteries in 6- and 12-volt types are now available for use in automobiles, but only a negligible number of these are sold, for the very good reason that their prices are exceedingly high (over $140). Such batteries, though they have many advantages, including very long life, practically no maintenance, and freedom from possible damage due to careless maintenance on the part of the user as compared with the common lead-acid type, are unfortunately restricted by their high prices to limited applications in industry and in military service.

Some consumers suffer considerable loss because they are not aware that a storage battery deteriorates seriously when not in use. A battery must never be operated when in a nearly discharged state, or allowed to go without needed addition of distilled water. These conditions more or less permanently reduce a battery's capacity. *Undercharging or standing without charge is far more likely to ruin a battery than moderate overcharging.*

Never work around the engine or electrical system of a car with a ring on your finger. An accidental short through the ring may cause it to become heated red hot with grave injury to finger and hand.

Battery additives

Additives or dopes (usually a mixture of Epsom Salt and Glauber's Salt) claimed to prolong the life of new batteries and rejuvenate or stimulate automobile storage batteries that are worn out or "dead" and will not take a proper charge are widely advertised, from time to time. A number of new ones are being offered at the present time because of the Federal Trade Commission and state officials' failure to take action against some of the most notorious of these ineffective liquids or powders. Such nostrums, usually in essence a mixture of Epsom Salt (magnesium-sulfate), Glauber's Salt (sodium-sulfate), or alum (aluminum-sulfate) have been repeatedly "invented" and "reinvented" since about 1885; they are without merit, now, as they were in previous revivals of the old idea. For example, an analysis of the highly aggressive advertised *"VX-6"* or *Voltex,* as it is also called, indicated that it consisted of a mixture of aluminum sulfate 42.9 percent, cadmium sulfate 2 percent, magnesium sulfate 1.9 percent, and water 53.2 percent. The advertising, plausible to the electrochemically uninformed, carried a number of outright misstatements and misrepresentations. (See also editorial in Sept. '56 BULLETIN.)

"Quick-charging" of storage batteries

A quick charge can be used on a storage battery but only in the case of necessity. An occasional quick charge, properly supervised, will not likely do any noticeable damage to a storage battery in good condition. Unfortunately, however, most batteries in need of charging are almost completely discharged, in poor condition, have a weak cell, or have "sulfated" plates. In such cases a quick charge should not be used.

Repeated use of the quick-charging method can shorten a battery's life by 75 percent. If the method is used on a good battery, the charging rate should be reduced considerably as soon as "gassing" occurs or the temperature of any cell reaches 110°F.

SPARK PLUGS

A lot of high-pressure advertising for spark plugs makes claims which are impossible of fulfillment—such as extremely long life, greatly increased miles per gallon, and increased horsepower. One ingenious manufacturer calls his spark plug an igniter, which makes it sound like something new and different, and no doubt better, to the reader of the advertisement. The best spark plugs for your car or any car are those of the same make and heat range supplied as original equipment and sold by a relatively small number of reputable manufacturers under their own names, e.g., *A.C.*, *Auto-Lite*, *Champion.*

Guarantees in this field have to be watched with care. Some propose to supply a new set of plugs if the first set does not perform as claimed. Such a guarantee is of no value, if the plugs are unsatisfactory.

IGNITION BOOSTERS

A host of devices have been offered at high prices to boost ignition or to intensify the spark. Demonstrations of these, though they may seem completely convincing, often involve a trick of some kind. Such devices are not needed and cannot perform as claimed.

TRAILERS

Four articles on trailers appeared in recent issues of the BULLETIN: "A preliminary report on trailers," Sept. '56++; "Trailers, or mobile homes," a discussion of trailer size, kitchen, bathroom, and bedroom arrangements, and electrical wiring, April '57+++; "House trailers," (listing of 23 makes of trailers, 25 to 30 feet or longer), June '57+++; "Travel and camping trailers," Sept. '57+++.

Mobile homes

A. RECOMMENDED

Angelus; Boles-Aero; Branstrator; Geer; Luxor; Mobile Cruiser; Schult; Spartan; Stewart; Superior; Trotwood; Vindale.

B. INTERMEDIATE

Fairlane; Florence; Imperial; Michigan Arrow; Nomad; Safeway.

B—

Buddy; Elcar; Nashua; Richardson.

▶ **REF:** BULLETIN, Apr. '57+++, June '57+++, Sept. '57+++.

Travel trailers

A. RECOMMENDED

Airstream • Avion • Boles-Aero • Ideal • Terry.

B+

Branstrator • Fan • Holiday Rambler • Shasta • Trotwood • Va-Ka-Shun-Ette • Yellowstone.

B—

Sportcraft.

* * *

The following are manufacturers of special types of small trailers which have not been thoroughly investigated and thus are not rated.

Camp trailers

Cargo-Camper • Nimrod Equipment Corp. • Reliart Trailer Co. • Spencer Sports Products.

Convertibles

C & B Mfg. Co. • Comstock Trailers • Cree Coaches, Inc. • King Kamp Koaches • King Trailer Co.

Trailer yachts

Neptuna Corp. • Terra-Marina Mfg. Co. • Trail-it Coach Mfg. Co. • Yachtland—Stanley Mobile Homes.

Teardrop style

Tommy Tucker Trailer Service.

MOTOR SCOOTERS FROM EUROPE

Motor scooters range in price from about $320 to $510, deliver 90 or more miles per gallon of gasoline-oil mixture, can carry two persons, and are extremely economical in terms of depreciation, cost of registration, and insurance. On a per-mile basis, it may indeed cost less to use a scooter than to take a bus or trolley.

The scooter has one serious disadvantage; it is absolutely unsafe on snow or ice and is rather uncomfortable in a heavy rain. When it rains, you must expect to get wet, or resort to a closed car. Some states prohibit the use of motor scooters on parkways.

A most important factor in the choice among models of similar type and serviceability is the availability *and competence* of the service agency.

Ratings are cr58.

A. RECOMMENDED

Lambretta 125 LDM Deluxe (Innocenti Corp., 45 Columbus Ave., New York 23) $350. Rated at 5 hp. Weight, 187 lb. 2

Zundapp Bella R153 (Phillip Phillips, Inc., 5102 Broadway, New York City) $419 includes double seat, speedometer, and steering lock. Rated at 8 hp. Weight, 300 lb. 2

Lambretta 150 LDM Deluxe (Innocenti Corp.) $450. *Model 150 LDA* at $500 is similar except that it has a rear seat, luggage rack, and electric starter. Rated at 6 hp. Weight, 194 lb. 3

Zundapp Bella 203 De Luxe (Phillip Phillips, Inc.) $509, with electric starter. Rated at 10 hp. Weight, 320 lb. 3

▶ **REF:** BULLETIN, Feb. '58+++

Notes on food and nutrition

FROM THE STANDPOINT of the average American, the most important diseases are by a very large margin heart disease and cancer. There are reasons to believe that, with regard to both of these, the consumer can do something to ward off or at least delay their attacks.

Deaths caused by diseases of the heart and circulation are far larger in number than deaths by cancer; heart disease is therefore much the most important of all causes of death in America. The principal diseases of the heart and circulation now account for *nearly two thirds of the deaths that occur* from all causes. Many millions of Americans now living may be expected to die of heart disease.

There is much evidence from the work of able research scientists that the high heart death rate may be due to excessive consumption of fats, and fats of the wrong kinds, coupled with a constantly decreasing tendency to take the amount of exercise necessary for maintaining health and vigor. Particularly alarming is the fact that atherosclerosis, the principal manifestation of heart disease, is now present in men of all ages—even in three quarters of young soldiers of an average age of 22 years examined at autopsy.

One of the best ways of warding off or postponing coronary heart disease is to keep the weight down. At least 20 percent of all adults in the United States are overweight to a degree which is injurious to health. (Even a slight degree of obesity is harmful.) Overweight goes with diabetes, gall bladder inflammation, gallstones, hernia, as well as heart disease. Being 20 percent above normal weight about doubles a man's chances of being struck by coronary heart disease. Obesity not only increases the danger to the arteries, heart, and kidneys, but also goes with an increased death rate from cancer.

There is no better way to keep well than to follow a properly balanced diet. Good nutrition does not solve all the problems of health for man, but it will come very near to doing so for most of us.

If you are going to diet to lose weight, *stay* reduced. It is dangerous to diet for weight reduction and then resume old habits and weight.

To keep weight down requires, among other things, reasonable restriction of the amount of fat consumed in the diet. The fats of bacon, salt pork, shortenings, oils and salad dressings, butter and margarine, constitute about 40 percent of the fat brought into the home. Meat, poultry, and fish provide another 27 percent. The rest appears in milk and milk products (other than butter), eggs, baked goods, and a few other foods. Nearly half the total fat consumed is in the form of cooking fats; from this it will be evident how important it is to reduce to an absolute minimum the amounts of hardened hydrogenated cooking fats used in the home and purchased as an ingredient of manufactured and ready-to-heat-and-serve foods.

The average American is eating a diet with about 40 percent of its calories from fat, and many consume even more than this (because high fat content makes food pleasing to the palate and satisfying). It would be wise for most people to reduce their fat consumption to 25 to 30 percent of total calories. Restriction of fat intake is believed to be much more important for boys and men, especially (and for women past the menopause).

The *kind* of fat may be more important than its quantity. The fats which are liquid at room temperature are for the most part relatively desirable (because high in unsaturated fatty acids) compared with those which are solid at room temperature (chiefly saturated fatty acids). The solid fats tend to be deposited in the arteries. Some of the liquid fats, consumed in moderation, may actually reduce the tendency toward fat deposition and clogging of the arteries. *The high death rate due to coronary disease is al-*

most certainly determined by the amount and types of fat in the foods we eat.

The so-called hardened or hydrogenated fats are a modern development. Their use became widespread about 40 years ago, and now they are almost universally adopted by food producing industries because of the greater convenience of the hardened saturated fats and better appearance and color, and the fact they do not tend to become rancid or modified in flavor with time and temperature.

The practice of French-frying in restaurants and food factories, growing rapidly in recent years, is an important factor in the whole problem, since hardened fats are used in this process to provide a high degree of "durability" and resistance to deterioration with heat and use. Besides having an undesirable effect on the arteries, the hardened fats are incomplete foods in that they are deficient in subtle essential substances (vitamins, minerals, and unspoiled proteins) needed for vigor and to help insure long life.

The best procedure for the average American is to regard fried foods as a luxury for occasional consumption only, to avoid margarine which is made of hardened fats, to reduce the consumption of butter, to favor the use of liquid oils such as corn oil where a food oil is needed. One internationally famous heart surgeon is now using corn oil and olive oil on his breakfast toast in lieu of butter or margarine because of his belief in the importance of substituting the unsaturated fats for the saturated ones.

The skin and underlying fat of chicken and fish and all visible fat of meat and chicken should be removed.

A margarine made essentially of non-hydrogenated corn oil (high in essential unsaturated fatty acids) has just been announced by the Pitman-Moore Company, P.O. Box 1656, Indianapolis, Ind. It will be available in retail drug stores.

Fortunately, the cheaper grades of meat are lower in fat than the top grades used by fine restaurants, and better still are fish and sea foods whose fats and oils are limited in amount and believed not to contribute to coronary disease. Take especial care to avoid not only cuts of meat that are especially high in fats but chopped meats, pork sausage, lamb patties, and the like, which are deliberately given a high content of fats by the seller in order to collect meat prices for a low-cost fat ingredient. Some fish and sea food low in fats are: cod, flounder, sea bass, trout, sole, clams, scallops, oysters, shrimp, crabs, and abalone. Bear in mind that the higher the grade of meat the more fat and marbling it contains; it is almost impossible to find high-grade meats, steaks, roasts, or chops that do not contain a highly excessive amount of fat. The government's grading system has unfortunately for many years favored a high degree of fattening of cattle, but consumers have lately shown their distaste for over-fattened meat and it is expected that the future will bring leaner cuts in the butcher shops, to the great advantage of those Americans who wish to avoid the hazards of overweight and the frequently disabling and fatal diseases of the heart and circulation.

> ***"From his food man gets his health and his diseases." (Dr. Jacques M. May, in Int. Record of Medicine)***

To be avoided so far as practicable are gravies and sauces, rich soups, salad dressings, fried fish and other fried foods, pie and pastries, ice cream, egg yolks, chocolate, bacon, buttered bread, cheese (except cottage), cream, creamed chicken, Danish pastries, Hollandaise sauce, whipped cream, and cake. Bear in mind that if you are at the dangerous age, or overweight, a single meal of "rich" foods containing excessive fat of the undesirable saturated kinds may bring on a heart attack.

Frying is clearly the least desirable of all cooking processes. Grilling, broiling, boiling, baking, and roasting are best. (Boiling or "poaching," although little used in American cookery, are very satisfactory for some kinds of fish.)

The fat in milk, cream, and butter is not a liquid as one might assume but a dispersed solid fat of a high degree of saturation similiar to the hydrogenated fats. Milk products are particularly rich in the less desirable short-chain, saturated fatty acids. Butterfat was found in various animal experiments to be definitely of a relatively undesirable type, and in one country where consumption of butterfat is among the highest in the world, the heart disease rate is also among the highest. For those who want dairy products in their diet, skim milk and cottage cheese are the best forms. Those who have a family history of heart disease, or a tendency toward it, should avoid rich dairy foods such as whole milk, cream and butter, most cheeses, and ice cream.

Foods it would be well to avoid so far as practicable are all ready-mixed, frozen, ready-to-heat-and-serve foods, packaged ready-prepared foods of all kinds, since all such foods are commonly made with processed "hard" fats. It is a striking and important fact that most factory-prepared foods are high in calories, but poor in essential nutritional qualities, and the high calorie values are the so-called "empty calories," due largely to sugar and starch and processed (denatured) fats.

The desirability of a low-fat, low-cholesterol diet, with minimum use of shortening and frying fats, fat meats, whole milk, cream, high-fat cheese, ice cream, and pastries is well established by medical experience and such a diet gives a lower death rate for people who have coronary disease (a two to one advantage in favor of persons on controlled diets).

Certain fatty acids, linoleic, linolenic, and arachidonic, are known as essential fatty acids, and a small amount of these is absolutely necessary in the diet. Practically speaking, linoleic is the most important of these for many persons. All three of these are unsaturated fatty acids, the type found predominantly in vegetable oils and in fats and oils of marine and fresh-water fish. A tendency to increase the proportion of sea foods in the American diet would seem clearly to be warranted, along with the use, where fat is necessary, of non-hydrogenated corn and cottonseed oils. (Corn oil seems to have especially desirable properties as a source of dietary fat.)

Nuts, like other fats from seeds, have a high content of the desirable unsaturated fatty acids (particularly true of filberts, walnuts, hickory nuts, and pecans). Their protein is of good biologic value. As they are a concentrated source of calories, they need to be consumed in moderation by most persons, and for some they may present digestive difficulties. They do not contain cholesterol, which is one of the substances under suspicion as a cause of heart disease. One should avoid use of so-called "roasted" nuts, which have usually been French-fried in a bath of hot fat.

One final word of advice: anyone who has reason to think he may have incipient heart disease should consult a good physician, submit to the required tests, and follow the doctor's advice faithfully.

SOME QUESTIONABLE FOODS DISCUSSED

Every year there are several million pounds of food additives used in this country whose safety for long-time consumption has not been established. These are materials which are not used or are very little used in the home, but lend themselves very well to factory production of foods, which for reasons of economy in distribution, and to "keep customers satisfied," must keep "without evident deterioration" for a long time in the store or on the pantry shelf.

A very large number of the additives are used to prevent foods from becoming stale in flavor, appearance, or odor. Most food manufacturers put far too much weight on the importance of "durability" in foods, being unaware of the hazards in the steadily-growing use of chemical additives employed to make food keep a long time.

The consumer assumes that if the additive is present in the food which he buys at the store, it must have been "passed on" by some government agency and found harmless and wholesome. Such an assumption is entirely unwarranted. Untested and inadequately tested chemicals are in very wide use in foods today "and their use constitutes a public health hazard . . . as great today as was the danger from untested drugs in the 30's." The food-chemical industry is for the most part fighting strongly against legislation which would provide means for safeguarding consumers who buy and use packaged food products of all kinds by requiring that the safety of a food additive should be established before it is put into use in manufacture. One major industry representative has the temerity to argue that the question of usefulness of an additive should be left to decision "in the market place."

Among the most important and questionable groups of additives are those which prevent rancidity of fats; these are present as ingredients in thousands of kinds of ready-prepared and ready-to-heat-and-serve foods; likewise in lard, oleomargarine, and other shortenings, frying fats, pastries, crackers, vegetable oil, potato chips, nuts, and many others.

The use of these additives permits great latitude in storage conditions, so that the grocer or restaurant keeper does not have to worry about maintaining low temperatures for baked goods, cooking fats, nuts, and other items that would normally be perishable, and have to be withdrawn from sale after a few days or weeks.

It is well to avoid all sorts of foods and food mixtures which contain artificial colors and other novel, unusual, or unfamiliar ingredients as shown by their labels, or by observation. It is the constant drive to produce and apply these which stimulate the food chemists to develop and use—before proper testing could possibly be carried out—untried ingredients that have not stood the test of time and experience. It is always wise to be old-fashioned, when it comes to questions of food selection.

TO AVOID THE THINGS that cause cancer

There is much reason to believe that the marked increase in deaths from cancer may be the result of the extreme activity and inventiveness of the manufacturers and the chemists in industry and government who are forever introducing new and untried substances into our working and living environments. There is no doubt at all that many of these materials, some in foods, some in air, and some in drinking water, some in other materials of daily usage in the home and elsewhere, have the possibility of causing cancerous degeneration in human tissues. As one expert put it, "we live in a sea of carcinogens." The potency of some cancer-starting chemicals is almost unbelievable. As little as a millionth of a pound daily for a month of some of these may cause tissue changes that would culminate in a cancer, perhaps years or even several decades later. Cancer ranks second as the cause of death, and the rate of cancer cases is continuing to rise.

Chemical science has grown so rapidly and the utilization of the new products and processes has taken place at such a rate that the additives and contaminating substances could not possibly be effectively studied with the time and researchers available. The scientists are, and will necessarily remain, a generation or two behind the problem so long as our national policies remain as they are in regard to toleration of new and strange food ingredients. Of over 700 chemical additives used in manufactured foods nowadays, about 270 have not had their safety established for such use. As one writer on the subject puts it, ". . . Every time that a natural substance is removed from a food, every time an adulterant is added to a food, the balance in nature is disturbed. . . . The chemical and cellular processes within the body cells cannot react to the passing whims of chemists without disturbance in function. . . ."

The increasing tendency to use ready-prepared, frozen, bottled, canned, and packaged foods which are shipped great distances and kept in warehouses or stores for many months or even years has heightened the danger. Another factor is the American readiness for novelty and change which makes foods of new and unfamiliar kinds acceptable, even welcomed, where they would not be in an older society. There is a drive for constant innovation and change in food materials, very advantageous to manufacturers and advertisers, but often most undesirable from the consumer's standpoint.

Synthetic food dyes, much used in every sort of ready-prepared packaged and bottled foods, are particularly under suspicion. Some dyes which have been assumed safe for many years are now revealed to have cancer-causing properties. Others that are in use are chemically similar in structure to substances known to be highly potent in causing cancer. All the synthetic food dyes come from chemical families which are of a poisonous nature, unrelated to the familiar bright natural colors seen in such fruits and vegetables as oranges, cherries, grapes, beets, and peppers.

Of 116 dyes which the consumer supposes to have been more or less guaranteed as safe by the U. S. government, at least 100 have not been extensively studied and found assuredly safe by qualified experts.

High in the list of substances in which food dyes are extensively used are cordials, candies and fancy cakes of all sorts, gelatin desserts, maraschino cherries, chocolate, jam, jellies, and marmalades, ice cream, soda fountain syrups and carbonated beverages, edible fats, cheese, butter, and margarine.

A bright, attractive color may conceal inferiority or, for example, give the impression that butter, ice cream, cake, or candy is rich in desirable ingredients rather than loaded with some uncertain and untested food dye.

The presence of dyes must usually be declared on the label, but Congress has unfortunately legally excepted three great classes of foods, butter, cheese, and ice cream, from this rule—as a favor to agricultural interests.

The dyeing and special processing are not done for the consumer—they are done for the manufacturers' and distributors' convenience.

Even dishwashing detergents, of which small amounts must remain on dishes, pans, and silverware, are sometimes dyed with a coloring agent that belongs to a family known to have cancer-causing properties.

A special difficulty in the problem is that potentially cancer-causing elements in a food may be without appreciable harm to a person in good health, living on a well-balanced diet, yet can cause disaster to a person whose diet must be skimped for economic reasons or because of some digestive or other difficulty. One must bear in mind that the cancer-causing properties of many deadly substances previously not suspected of being in the least harmful were found *by injuries they caused to human beings,* and these results were *later* confirmed by tests on animals. In some cases involving food dyes, the danger was disclosed after the substance had been used a score or more of years by human beings. One was consumed for nearly 20 years to the extent of half a million pounds, yet was during that time officially certified as safe for use in foods. Certain dyes once used in coloring margarine and butter were so toxic that the test animals died of poisoning before there was an opportunity to see if some would develop cancers in due time.

An artificial sweetening agent, once deemed acceptable, was found, when tests were made, to cause tumors in the livers of test animals.

* * *

It will be wise to avoid oranges and lemons treated with biphenyl or sodium o-phenylphenate as a preservative, or citrus fruit wrapped in biphenyl-treated paper, apples wrapped in diphenylamine-treated papers; likewise, white and sweet potatoes that have waxed and dyed skins (a common practice nowadays), and canned vegetables to which coal-tar color (dye) has been added. Do not use any part of the necks of chickens, which are the site of injection of growth-accelerating pellets (hormones).

The dangers in the many exposures to toxic materials through food substances and pollution of air and water lies in the fact that the healthy and the sick and those who have normal and abnormal digestive and circulatory systems are all exposed to them throughout a lifetime.

The beginnings of cancer may be in an overheated fry pan or more likely in the overheated deep-fry bath of the restaurant; many restaurants favor that method of cookery because of its economy, speed, and convenience. Avoid overheating fats of all kinds and take great care to cut off all charred, blackened, or burned portions of roasts, steaks, and other fatty foods. It would be the part of wisdom not to consume toast which has been burned black or to a dark shade. (The problem possibly does not arise with genuine French and Italian breads, that do not contain added fat.) At the present time, there is a veritable craze, at least on the part of restaurateurs, for "charcoal-broiled" meats, fish, even vegetables which, as a popular newspaper columnist has pointed out, strongly resembles in appearance and flavor "a brand not snatched quickly enough from the burning." Fats that have been overheated strongly tend to produce digestive distress and are definitely toxic. There is good evidence that certain by-products of overheating of fats and charring of fatty materials may contribute to the causation of cancer.

Other factors that may contribute to cancer in the digestive tract are the use of foods and beverages which are too hot; likewise the overuse of foods which are highly spiced, excessively sour, or otherwise of a nature to cause irritation or alteration of the mucous membranes of the stomach.

A particular danger at the present time is in the extent to which farmers and cattlemen are feeding meat animals and poultry potent sex hormones and diethylstilbestrol and arsenic-containing drugs or medicines intended to increase the efficiency with which the animals utilize their feed. In one study, 60 percent of chickens examined were found to contain unabsorbed portions of the pellets of diethylstilbestrol. It is said that a very high percentage of all the cattle now being marketed have been artificially fattened and growth-stimulated in this way.

There is a growing concern over the extensive use of chemical additives that are designed to prevent spoilage of meat and fowl. Antibiotics are now being used very widely for this purpose. (Poultry so treated is labeled "Acronized.")

USE OF SALT
should be minimized

Typical intake of salt by adults has been found to be about 10 grams per day, or five to ten times the body's actual requirement. It is certain that Americans use far too much salt in and with their food. Overuse of salt is not only a contributing factor in obesity and heart disease but tends to favor the decay of the teeth. It is believed that salt intake is a major causative factor in the development of essential hypertension.

So far as practicable, one should restrict the intake of salt to that which is natural to the food itself, and not add salt at the table. One should, of course, avoid the highly overseasoned soups and bouillons served by many restaurants; likewise pickles, ham, bacon, salt fish, luncheon meats, corned beef, salted crackers, and pretzels. Some bakers' bread contains an objectionably high amount of salt.

Special care in the use of both salt and fats is necessary for elderly persons and persons who come from families having a tendency toward diseases of the heart or circulation. Such persons should choose such protein foods as lean meats, sea food, non-fat fish, low-fat cheeses (chiefly cottage cheese), and white of egg, rather than fatty foods, bacon, ham, and the usual dairy products high in butterfat.

A common source of sodium little appreciated by the consumer is monosodium glutamate, sold under a number of trade names and known to the food trades as MSG. Fortunately, this substance is required to be declared on the label of packaged goods shipped in interstate commerce. An observing person willing to read food labels, as everyone should, has the chance to avoid MSG by doing without many canned and packaged items (nearly all canned soups contain MSG which is now even being added to a large proportion of the baby foods commonly sold in glass jars). Other popular food ingredients that contain substantial amounts of sodium, the chief ingredient of salt, are baking powder, baking soda, disodium phosphate, sodium alginate, sodium benzoate, sodium sulfite, and sodium propionate (used as a preservative in bakery goods).

Persons on a sodium-restricted diet should check with their physician before using any unprescribed medicines, for such medicines may often contain a high proportion of sodium.

LABELS on packaged foods

Much can be learned by the observing consumer who will carefully read the labels on the packaged foods which today constitute a very large portion of his food purchases. Grave abuses have crept into food and beverage labeling; these call for prompt correction by both federal and state food and drug officials. Regulations require that the usual or common name of each ingredient must appear on the label, and the substances present in the largest quantity are listed first. Thus, the order of ingredients will often give a clue to the quality of the product.

Chief among the faults of labeling is the technique, which manufacturers have developed to a high degree, of making it difficult to read the names of the ingredients. They often print the ingredients statement on a transparent surface of a package whose contents are about the same color as the printing ink, or they will print in type too small to be read by persons not having the keenest vision, or they put the lettering on an inside wrapper that is difficult to read through an outside film of poor transparency. Other practices: making the printed words almost impossible to read because of multiple reflections from cellophane wrappings, various locally applied price and other labels or stamping so placed as to render the ingredients label illegible, and placing lists of ingredients in locations where they will be hard to see or hardly noticed.

If there are items that should show ingredients and do not, ask your state food and drug commission *why* they do not. The reply may indicate much about what is wrong with food and drug law enforcement as currently practiced in most states and by federal authorities. It will pay to check from time to time the actual net weights of packaged items, especially those high in price per pound, like meats, fish, poultry, since overcharges due to incorrect weight markings are very common.

Sometimes labels actually misrepresent the contents of packages. Thus, concentrated frozen juice reconstituted with water has been sold as fresh orange juice. Artificially colored oranges are often packaged in such a way that the statement of added color is not in evidence or is hard to find. "Cheese foods" and "cheese spreads" may be so labeled as to give the impression of being real cheese. Skim-milk cheese and part-skim-milk cheese should be clearly identified as such, for the benefit of the many persons who are looking for dairy products of low fat content.

A Grade A label on poultry carries no implication of wholesomeness or freedom from disease conditions. It may indicate only that the product meets a certain standard of outward physical condition and appearance. In some instances there may even be a state seal of quality applied to poultry which has met grade standards, but has not been inspected for wholesomeness.

COFFEE

Coffee should when possible be made with water which is not very hard and is not alkaline. Soft or moderately hard water gives the best beverage. Flavor of coffee is impaired when the water has been softened by the zeolite method. The water should be very hot (between 180 and 200 degrees), but the coffee should never be boiled.

The following materials have a harmful effect on coffee flavor with the effect decreasing in the order mentioned: tinplate, aluminum, copper, and nickel. Glass, porcelain, and similar materials have a minimum effect on coffee flavor, and stainless steel probably very little.

Coffee stored in air becomes stale within two weeks. Vacuum-packed coffee is not as good as fresh coffee, although when first opened it is better than stale coffee (it stays at its moderate level of quality for a long time, until the can is opened). Keeping ground or bean coffee in the refrigerator or freezer will help to postpone its deterioration in quality.

There has been a marked decline in coffee quality in the last several years. With the rise of the soluble coffee business to nearly one fourth of the market, there has been an erosion of American taste for good coffee. Packers of regular coffee were quick to take advantage of this loss of public discrimination and have offered to the public vacuum-packed ground coffee of much lower grades than were heretofore deemed acceptable. Two brands of coffee that have maintained good quality are *Martinson's* and *Yuban;* other good quality coffees are A & P's *Bokar* and *Eight O'Clock, Hills, Folgers,* and *Maxwell House.*

There is at least some reason to doubt the wholesomeness of instant coffee consumed over a long period of time, but unfortunately the expensive work that would be required to establish its complete safety, or the reverse, has not been performed and published.

CIGARETTE SMOKING, and cancer of the lungs

Something like one third of the total American population are smokers, who consume a prodigious number of cigarettes, 800,000 a minute or 400,000,000,000 a year. All smoking shortens life, but cigarette smoking carries a far greater risk than smoking cigars or a pipe. About one out of every 10 men over 25 who smoke more than a pack a day will contract lung cancer by the time he reaches the age of 75. In one study, English physicians who were fairly heavy smokers had 40 times the lung cancer rate of non-smokers. Cigarette smoking not only increases the number of deaths from cancer of the lungs but also from other diseases, particularly diseases of the heart and arteries. Heavy smokers have about twice the death rate of non-smokers. It is now well known that filters do not solve or even mitigate the problem.

Tests conducted for Consumers' Research show that American brands of cigarettes contain 5 to 23 parts per million of arsenic. Arsenic is not only a *cumulative poison* but it has a known association with cancer. Taken into the body, it is deposited in the kidneys, liver, intestinal walls, skin, spleen, lungs, hair, and bones.

It is the only material so far found to be present in cigarettes which is known to be capable of inducing cancer in human beings. Lung cancer from cigarettes is known to arise after a long delay, and it is well known that cancerous growths triggered by arsenic may also arise after a lapse of many years. The dangers of steady small doses of arsenic are now so well known that medication with arsenic compounds has been practically given up by physicians except in a certain few highly dangerous diseases where it is necessary to face the risk of injury from the medication.

Arsenic, unfortunately, is present in surprisingly high amounts in the dust of urban homes and the dust of cities. In view of this multiple exposure, it would seem wise to eliminate arsenic-containing cigarettes from one's sources of daily arsenic intake.

Persons smoking two packs a day have a 70 times greater chance of developing lung cancer than non-smokers, and one in 8 to 10 men smoking two packs a day can expect to die of lung cancer.

While switching to a brand of cigarettes which are low in arsenic cannot guarantee safety from the cancer-causing effect of cigarettes, it would seem nevertheless to be a wise and reasonable precaution. Tests by Consumers' Research of cigarettes from three Near-East sources showed negligible amounts of arsenic by comparison with the American brands. We believe that these findings would probably apply to all or most cigarettes made from Greek or Turkish tobaccos. (Brands Consumers' Research found to be arsenic-free or nearly so were *Abdulla & Co., Ltd., "Turkish No. 11"; Ed. Laurens, "Le Khedive"; Hellas No. 1.*)

With regard to the matter of cigarette filters, it is worthy of note that the effect which the consumer expected is not achieved. For while filters can reduce the amounts of tar, nicotine, and arsenic in the smoke to an appreciable extent, the effect is not nearly large enough to eliminate the harmful effects of smoking. Most cigarette manufacturers, in offsetting the effect of the filters in producing a weaker, blander smoke, have used heavy-bodied, lower-quality tobaccos. In this way, cigarette manufacturers have given the appearance of providing a safeguard against the injury to health from smoking without actually doing so; the smoke from their cigarettes does not contain less of the harmful constituents, as readers of cigarette advertisements have been lead to expect.

The fact that the federal, state, and city taxes on cigarettes reach the huge total of $2,300,000,000 (of which about 70 percent goes to the federal government) is one fact that helps to account for the lack of interest of federal and state government agencies in giving due and repeated warning to consumers of the proven dangers of cigarette smoking.

RESTAURANTS

When you are "shopping" for a meal, heed the indications of your eyes and your nose. A good restaurant should be clean and should look clean and, above all, there should not be the smell of hot grease which goes with a restaurant that does too much of its cookery in deep-fat fry baths.

Restaurant food is best when the menu is not too large for the size of the establishment. A large number of menu entrées usually means much use of canned, frozen, ready-prepared, ready-to-heat-and-serve foods. With a limited menu, a restaurant of small or moderate size is more likely to serve fresh foods, freshly prepared, rather than canned soups and consommé made from soup essence, and meats, chickens, and other foods carried over for many hours and reheated in the oven, broiler, or fry bath at the time of serving. Avoid a restaurant that uses excessive amounts of pepper and other condiments, and especially avoid restaurants where foods are oversalted. (Excessive use of salt and spices is definitely bad for the health.)

The consumer would do best not to patronize, except in cases of necessity, restaurants which feature very quick service; fast food service very often goes with foods that will be prepared for serving by reheating previously cooked foods in the oven, broiler, or in hot grease, or vegetables kept too long on a steam table and hence low in vitamin values and in flavor.

Avoid restaurants where insecticides are sprayed or there is an odor of insecticide in the air (from lindane vaporizers, for example).

Unsanitary conditions and careless or negligent handling of food should be reported to the proprietor, or if really bad, to the city or state health authorities.

ADDITIONAL POINTS
on choice of foods

Overuse of canned and frozen citrus juices can be very harmful to the teeth. These and *Coca Cola* and other cola and acid (tart) drinks are definitely a handicap to maintenance of good mouth conditions in children and the preservation of good teeth in adults. Overuse of milk and fruit juices by children can lead to serious nutritional difficulties and insufficient protein in their tissues. It is important that the diet of children should contain adequate amounts of protein (which is very often deficient in children's food, because of overuse of desserts, ice cream, candy, soft drinks). Cereals, legumes, nuts, and some vegetables contain protein but not of the best quality; good quality protein is available in fresh fish, lean meats, eggs.

Many ready-to-eat foods are padded to make a little look like a lot; thus, there may be as little as 45 percent of crab meat in crab cakes; the rest is "filling," poor in protein.

Much ill health of children is due to bad eating habits—eating of snacks instead of meals and particularly an excess of sweets, cookies, and other carbohydrates and soft drinks, combined nowadays with lack of exercise due to much looking at TV.

A tendency toward overuse of alcohol may very often be due to a diet which is out of balance, lacking in some essential nutrient. An out-of-balance diet will often be the result of eating too much in poor restaurants, whose food-preparation practices often greatly impair the nutritional qualities of foods.

Intestinal obstruction can be serious and may even require prompt operation by a surgeon to save life. It may occur even from careless eating of oranges or their consumption by persons who have poor teeth or false teeth. (Persimmons and peaches, too, are often involved.) Oranges should be eaten slowly, the fruit broken into small segments, chewed well; do not swallow the pithy material.

Do not accept artificially-sweetened jams, jellies, and beverages in place of those containing sugar. Use of highly sweetened food is undesirable, but the use of artificial sweeteners as a substitute for sugar is much more so. Only those who have medical reasons for so doing should use artificially sweetened foods and beverages.

Food handlers greatly underestimate the importance of continuously maintained temperatures close to zero Fahrenheit all the way from packer to consumer. Thus frozen pre-cooked foods may often be bacteriologically unsafe. Some have been implicated in food-borne infections, probably because at some time during their shipment and handling they have been allowed to warm up to unsafe temperatures. There can be no sure safeguard against this danger, but one can judge to some extent by the way in which the grocer's food cabinets are kept.

Garden and lawn equipment

Power lawn mowers • hand lawn mowers • garden tractors • electric hedge trimmers

lawn sprinklers • menders for plastic garden hose • snow removal equipment

POWER LAWN MOWERS

The rotary lawn mower is superior to the reel type for mowing lawns that have weeds, especially such weeds as buckhorn and dandelion. The rotary mower will cut higher grass and is superior for trimming around bushes, etc., and it will eliminate need for a good deal of hand trimming.

The rotary mower, however, has one very serious disadvantage: it is an *extremely dangerous* tool. Accidents of a serious nature are very common with rotary power mowers. Some cause death and many may cause permanent crippling or disability, not only to the operator but to other people in the vicinity of the mowing operation.

A reel-type power mower will do an excellent mowing job on lawns that are in good condition and relatively free from weeds; it is much less likely to "scalp" high spots in the lawn than a rotary or "hammer-knife" mower. Reel mowers are much less dangerous than rotary mowers; they do not throw stones or other foreign objects with sufficient force to cause serious injury. However, accidents do occur with reel mowers, chiefly to those who attempt to free a jammed reel without shutting off the engine.

Size of mower

The smaller mowers in both rotary and reel type with a width of cut of 17 or 18 inches are the easiest to operate and maneuver and are satisfactory for small lawns; a mower that will cut a 22-inch or larger swath is desirable for larger lawns. The larger manually-propelled rotary mowers are heavier, and harder to push.

Two-cycle vs. four-cycle engines

Two-cycle engines used on some of the cheaper mowers have a number of disadvantages. They are less durable, and engine lubrication is achieved by mixing oil with gasoline at the time the gasoline is put into the tank, which is inconvenient. The two-cycle engines have the advantage that they can be turned upside down without spilling oil. This is important for rotary mowers, which require a thorough cleaning of the underside of the body after each use.

Unless otherwise noted in the listings, engines are four-cycle. Prices given are list. Considerable money can be saved by buying a mower when the season is well along, when prices are cut considerably. Ratings are based on over-all design and performance of the mowers, and are cr57.

Reel-type mowers

A. RECOMMENDED

Craftsman (Sears-Roebuck's Cat. No. 99—8144) $89.50, plus freight. *Briggs & Stratton* engine. 1.75 hp. 20-in. cut. Height adjustment, ½ to 2¼ in. Weight, 97 lb. Reel axle was subject to clogging with grass at one end. Construction and finish were judged good. 2

Cooper Klipper (Cooper Mfg. Co., Marshalltown, Iowa) $131.25. *Briggs & Stratton* engine, 1.6 hp. 18-in. cut. Height adjustment, ½ to 2¾ in. Weight, 101 lb. Performance in test, very good. A well-built and well-finished mower. 3

Eclipse Rocket (The Eclipse Lawn Mower Co., Prophetstown, Ill.) $134.50 f.o.b., factory. *Briggs & Stratton* engine, 1.75 hp. 20-in. cut. Height adjustment, ¾ to 1½ in. Weight, 120 lb. Performance in test, very good. A substantial, well-made mower. 3

Toro Sportlawn (Toro Mfg. Corp., Minneapolis) $140. *Briggs & Stratton* engine, 1.75 hp. 20-in. cut. Height adjustment, ¼ to 2⅜ in. Weight, 92 lb. Performance in test, good, but rigid handle made mower tiring to operate. 3

Toro Sportlawn Power Handle Reel Unit (Toro Mfg. Corp.) $70. This mower unit was identical with the *Toro Sportlawn* above and was to be used with the *Toro Power Handle* described on page 140 with the

Toro Power Handle Rotary. Weight of complete assembly, power handle, and mower, 102 lb.

B. INTERMEDIATE

Jacobsen Manor (Jacobsen Mfg. Co., Racine, Wis.) $197.50. *Jacobsen* 2-cycle engine, 1.8 hp. 21-in. cut. Height adjustment, 5/16 to 2¼ in. Weight, 130 lb. A very well-built mower with a quiet engine. This *Jacobsen* mower would be *A. Recommended* if supplied with a four-cycle engine. 3

Hand-propelled rotary mowers

B+

Goodall, Model 19L (Goodall Sales Corp., Minneapolis 18) $90. *Lauson* engine, 2 hp. 19-in. cut. Height adjustment, 0.75 to 2.75 in. Weight, 52 lb. Had adjustable front guard. Mower did a good job of mowing and was easy to push; it spread grass cuttings evenly over the lawn. ¶*Model 20G,* at $139.50, with a heavy-duty, ball-bearing *Goodall Lauson* engine, should be worth the extra price for those who want a mower to last several years before major repairs are needed. 2

Toro Whirlwind 18 (Toro Mfg. Corp.) $94.50. *Briggs & Stratton* engine, 1.7 hp. 18-in. cut. Height adjustment, 0.75 to 2.75 in. Weight, 46 lb. Well guarded, except the chute exit. This mower did a good job of mowing, and was very easy to push. 2

Wardmast'r 21 (Montgomery Ward's Cat. No. 84—8331) $86.50, plus freight. *Clinton* engine, 2.5 hp. 21-in. cut. Height adjustment, 0.75 to 2.5 in. Weight, 66 lb. Cutting height quickly and easily adjusted. Well guarded except at chute exit. This mower did a good job of mowing, and was easy to push. 2

Cooper Cyclo-Mo-20A (Cooper Mfg. Co.) $116.50. *Briggs & Stratton* engine, 2.25 hp. 20-in. cut. Height adjustment, 1.4 to 3.4 in. Weight, 56 lb. Well guarded. Guard rods in chute caused clogging in heavy grass; removing the rods corrected this but, of course, eliminated an important safeguard. Did a good job of mowing, and was easy to push. 3

B. INTERMEDIATE

Thrifti-Cut, No. 8-D-103 (Barnes Mfg. Co., North Kansas City, Mo.; sold by Firestone Stores) $40. *Clinton* 2-cycle engine, 2 hp. 18-in. cut. Height adjustment, 1.4 to 2.4 in. Weight, 37 lb. Fairly well guarded except at rear where skirt did not extend below blade. Did a good job of mowing. Considered suitable for use on small lawns. Was very easy to push. 1

Eclipse Duo Master 19 (Eclipse Lawn Mower Co.) $97.50. *Briggs & Stratton* engine, 2.25 hp. 19-in. cut. Height adjustment, 1 to 2.75 in. Weight, 60 lb. A well-guarded mower; however, hinged wire guard over chute caused clogging with grass. The *Eclipse* did a good job of mowing but was somewhat hard to push in mowing uphill, when set at lowest cutting position. 2

Lawn-Boy 7100 (Lawn-Boy, Div. Outboard Marine Corp., Lamar, Mo.) $100. *Lawn-Boy* 2-cycle engine, 2 hp. 21-in. cut. Height adjustment, 1 to 3 in. Weight, 47 lb. A well-guarded mower except at chute exit. Did a good job of mowing and was very easy to push and maneuver. A good mower; would be rated *B+* for those who do not object to a 2-cycle engine (see text). 2

Craftsman (Sears-Roebuck's Cat. No. 99—8160) $102.50, plus freight. *Craftsman* engine, 2.75 hp. 21-in. cut. Height adjustment, 0.5 to 3.0 in. Weight, 71 lb. Well guarded except at chute. Fully enclosed V-belt drive from engine to blade shaft. Did a good job of mowing. Slight clogging of grass at one side of chute. Because the chute exit is at the center of the right side, this mower has a tendency to throw grass clippings over the operator. Relatively easy to push. 3

Jacobsen, Model 21MB (Jacobsen Mfg. Co.) $117.50. *Jacobsen* engine, 2-cycle, 3.0 hp. 21-in. cut. Height adjustment, 0.6 to 2.75 in. Weight, 66 lb. Each of four blades is fastened to a rotating disk with a single bolt which permits the blades to swing back if a solid object is struck. The mower is well guarded except at chute exit. Did a fairly good job of mowing but was hard to push. 3

Penn Acco (Pennsylvania Lawn Mower Division, American Chain & Cable Co., Inc., Exeter, Pa.) $110. *Briggs & Stratton* engine, 2.25 hp. 20-in. cut. Height adjustment, 1.25 to 3.25 in. Weight, 47 lb. Well guarded except at chute exit. Location of chute at rear is not as desirable as front-right location. Did a good job of mowing but was hard to push at lowest setting. 3

Reo Spin Trim TK-21 (Motor Wheel Corp., Lansing, Mich.) $120. *Reo* engine, 2.25 hp. 21-in. cut. Height adjustment, 1.0 to 3.25 in. Weight, 74 lb. Two cover plates were provided for chute exit in right side of body. Instructions called for both plates to be removed in mowing of long grass and weeds; this would be dangerous, as tips of the revolving blades were very close to the surface of the casing. In heavy grass, the mower deposited some of the cuttings in clumps on the lawn. Was fairly easy to push (about average). 3

The following four mowers were considered more hazardous to operate than the others tested because the design was such that the revolving blades came to close to the chute exit for safety.

B—

Choremaster, Model A-1229 (Choremaster Div., Weber Engineered Products, Inc., Cincinnati 4) $115. *Briggs & Stratton* engine, 2.75 hp. 21-in. cut. Height adjustment, 1.5 to 3.5 in. Weight, 65 lb. Mowed satisfactorily and was easy to push. ¶A later model is equipped with a partial guard over the bottom and would be rated *B. Intermediate.* 3

Homko RF-22A (Western Tool & Stamping Co., Des Moines 13, Iowa) $115. *Briggs & Stratton* engine, 2.75 hp. 22-in. cut. Height adjustment, 0.5 to 3.00 in. Weight, 63 lb. The *Homko* did a good job of mowing, and was easy to push. 3

C. NOT RECOMMENDED

Snapper Twenty DeLuxe, Model 20D1 (McDonough Power Equipment, Inc., McDonough, Ga.) $97.50. *Briggs & Stratton* engine, 2.25 hp. 20-in. cut. Height adjustment, 1.5 to 2.75 in. Weight, 65 lb. Chute exit at right side of body was not well guarded. Revolving blade tips were very close to chute exit. Mowed satisfactorily, and was fairly easy to push. 2

Fairbanks Morse, Model RD-21-R (Fairbanks Morse & Co., Fair Lawn, N.J.) $109.50. *Clinton* engine, 2.5 hp. 21-in. cut. Height adjustment, 0.75 to 2.75 in. Weight, 66 lb. Handle attachment was such as to permit mower to roll back over feet of operator (a feature contributing to hazard in use). 3

Self-propelled rotary mower

C. NOT RECOMMENDED

Toro Rotary Power Handle Unit (Toro Mfg. Corp.) $110; power handle, $90. *Briggs & Stratton* engine, 2.75 hp. 22-in. cut. Height adjustment, 1.00 to 3.00 in. Weight, 96 lb. with power handle. V-belt drive from engine to bevel gears to cutter blade. Traction-drive to wheel from V-belt and idler pulley acting as a clutch. Well guarded except at chute. Power unit was easy to attach and remove. Maximum speed, 2.6 m.p.h. This mower was unusually heavy; its weight made it more difficult to maneuver than mowers of lighter weight. 3

Rotary electric mower

B+

Silent Scott (O. M. Scott & Sons, Marysville, Ohio) $169, complete with 125-ft. 3-wire cord and reel. "Unconditionally guaranteed for 5 years" with the strongest most-clearly-set-forth warranty we have seen for any electrical appliance. Powered by *Westinghouse* continuous duty motor rated at 7.8 amp., 115 v. 19-in. cut. Height adjustment, 0.5 to 3 in., by 0.5 in. increments, very easy and quick to adjust. Weight, 70 lb. Exceptionally well guarded mechanically. Satisfactorily passed tests for electrical safety. Had light to facilitate mowing at night, but this use is not recommended as grass at night is usually wet with dew and it is not considered safe to use an electric mower on wet grass (see "Safety in the home" section, page 95). Did a good job of mowing, and the mower itself was easy to push, but the combined weight of the handle and part of the cord (which must be dragged after the mower) is substantial; pushing the mower became very tiring on level ground, after a moderate period of use. 3

Hammer-knife power mowers

The so-called hammer-knife mowers are actually a modification of the rotary mower, but instead of a vertical shaft with a single blade revolving in a horizontal plane, they have a larger number of smaller blades (jointed, in some cases) revolving on a horizontal shaft. The hammer-knife mowers appear to be much safer to operate than the popular rotary mowers. The hazards were judged to be about the same as with the reel power mowers.

B. INTERMEDIATE

Henderson Contour 20 (Henderson Mfg. Co., Fisher, Ill.) $130. Roller, $4.95; leaf mulcher, $3.95. *Clinton* 4-cycle engine, 2 hp. 20-in. cut. Height adjustment, ⅞ to 2⅜ in. Weight, 62 lb. Not self-propelled. Did a satisfactory job of mowing on smooth lawns and also cut weeds satisfactorily. Considerable scalping of turf on uneven ground when set at lowest height setting. Was easy to push and maneuver. 3

C. NOT RECOMMENDED

Mott, Model 18A (C. W. Mott, Brookfield, Ill.) $158.50. Leaf mulcher, $4. *Clinton* 4-cycle engine, 1.7 hp. 18-in. cut. Height adjustment, ¾ to 1¾ in. Weight, 97 lb. Not self-propelled. Since small unintentional up-and-down movements of the handle changed the height to which the grass is cut, the cut was uneven. On uneven ground, the mower scalped the ground badly. Fairly easy to push and maneuver. 3

▶ **REF:** Bulletin, July '57, Aug. '57.+++

HAND LAWN MOWERS

A. RECOMMENDED

Craftsman (Sears-Roebuck's Cat. No. 99—8172K); **Eclipse L; Jacobsen "18".**

B. INTERMEDIATE

American Republic; Eclipse Vogue; Clemson E-17, Model L.

C. NOT RECOMMENDED

MontaMower.

Narrow-cut mower for lawn trimming and edging

A. RECOMMENDED

Pennsylvania Lawn Trimmer and Edger.

LAWN SWEEPER

If your lawn is rather large, and if the method of cutting or the mower action is such that the clippings are deposited in windrows, or if the grass is cut infrequently, a lawn sweeper can be used to a good advantage.

B. INTERMEDIATE

Craftsman Lawn Sweeper (Sears-Roebuck's Cat. No. 99—8387) $32.50, plus freight. Brush reel had four fiber brushes, and was mounted in ball bearings. Height of the brushes above the ground was adjustable. The sweeper did a satisfactory job on dry leaves on level ground, but was somewhat hard to push on uneven ground when brush reel was set low. cr55

GARDEN TRACTORS

A tractor with a gear transmission and a reverse gear is much easier to operate than one that lacks the reverse gear, and is judged well worth its higher price.

A. RECOMMENDED

Simplicity, Model LB (Simplicity Mfg. Co., Port Washington, Wis.) $180, plus freight. Powered by *Briggs & Stratton* 2¾-hp. engine; 2 forward speeds, and reverse gear. Equipped with 5.00 x 12 tires. Similar to *Wards Hoe-Trac.*

Simplicity, Model FB (Simplicity Mfg. Co.) $230, plus freight. Powered by *Briggs & Stratton* 2¾-hp. engine; gear transmission, 6 forward speeds, and reverse (latter, very desirable). 6.00 x 12 tires.

Wards Hoe-Trac (Montgomery Ward's Cat. No. 87—5826R) $173, plus freight. Powered by *Clinton* 4-cycle engine rated 3 hp.; 2-speed transmission with reverse. 5.00 x 12 tires. Tread width adjustable. A well-built tractor with ample power to operate a 24-in. lawn mower while pulling operator on a sulky. ¶A 3½-hp. *Chor-Trac* (Cat. No. 87—5821R), with 6 forward speeds, and reverse, is available at $267, plus freight.

B. INTERMEDIATE

David Bradley (Sears-Roebuck's Cat. No. 32—5283) $200, plus freight. 1¾-hp. 4-cycle *Briggs & Stratton* or *Continental* engine. Disk-type clutch. Used 6.00 x 16 tires and tubes. Well-built tractor, ample power, but, because of large size, somewhat clumsy to operate compared to *Hoe-Trac* and *Simplicity*. ¶Current model (Cat. No. 32—5268), $175, plus freight, is now equipped with 2¾-hp. engine and 6.70 x 15 tires. Reverse drive, $18, plus freight.

Accessories for Hoe-Trac and Simplicity garden tractors

A. RECOMMENDED

Lawn Mower (Montgomery Ward's Cat. No. 87—5052R) $58, plus freight. (*Simplicity*, $65.) Width of cut, 24 in. Height of cut adjustable from ¾ in. to 3 in.

Plow (Montgomery Ward's Cat. No. 87—5466R) $28.50, plus freight. (*Simplicity*, $28.) 6½ in.

B. INTERMEDIATE

Sulky (Montgomery Ward's Cat. No. 87—5353R) $25.50, plus freight. Equipped with 14 x 2½ in. tires. Turning radius of the mower when equipped with sulky, about 18 ft. (too large to maneuver easily even on fairly large lawns). ¶New model (Cat. No. 87—5860R), $58, plus freight.

Snow Plow-Bulldozer (Montgomery Ward's Cat. No. 87—5632R) $22, plus freight. (*Simplicity*, $20.) Blade, 30 in. wide, 15 in. high. Performed satisfactorily on test with snow and slush about 6 in. deep.

C. NOT RECOMMENDED

Sickle Bar (Montgomery Ward's Cat. No. 87—5637R) $58, plus freight. (*Simplicity*, $58.) Width of cut, 30 in. Satisfactory in fairly short grass and 12- to 18-in. weeds, and for this would be rated *B. Intermediate*. Grass and weeds, when tall, quickly piled up in front of machine and caused clogging.

Accessories for David Bradley tractor

B. INTERMEDIATE

Lawn Mower (Sears-Roebuck's Cat. No. 32—5380F) $70, plus freight. Width of cut, 24 in. Did a fair job of cutting grass when set at maximum cutting height, good when set at 1½ in. Lawn mower with tractor was difficult to maneuver on average size lawns because of large size of tractor wheels.

Plow (Sears-Roebuck's Cat. No. 32—5316F) $30, plus freight. 6 in. Satisfactory for light plowing where no heavy sod was present, but tractor was very hard to handle.

Lawn Roller (Sears-Roebuck's Cat. No. 32—5332F) $26, plus freight. Turning radius of tractor when equipped with roller, too large to maneuver easily even on fairly large lawns.

C. NOT RECOMMENDED

Snow Plow-Bulldozer (Sears-Roebuck's Cat. No. 32—5328F) $19, plus freight. Blade, 39 in. wide. Ease of handling, only fair; difficult to make 180° turn on 5-ft. sidewalk. Might warrant a *B* rating for large areas and wide walks.

Sickle Bar (Sears-Roebuck's Cat. No. 32—5324F) $57.50, plus freight. Width of cut, 32 in. Satisfactory for fairly short grass and weeds and for these would be rated *B. Intermediate*. In tall growth there was considerable piling up in front of machine, which caused clogging.

Tiller unit

This attachment is designed for use with the *Toro* power handle described under power lawn mowers (see page 140).

B—

Toro Tiller Unit (Toro Mfg. Corp.) $94.50. Rotor 11½-in. diameter with 20 cutting edges. 15-in. cut (extensions available to increase cut to 21 in.). Not self-propelled. Unit was difficult to move from place to place by pushing. Required a great deal of muscular effort to operate. Weight with power handle, 104 lb.

ELECTRIC HEDGE TRIMMERS

There is a substantial hazard in using a hedge trimmer as there is with nearly all power tools. The problem is worse with hedge trimmers than with some other tools because there is no way in which the cutting blades can be guarded and at the same time be free to do their work effectively. Some manufacturers have been more resourceful in providing safety in their design than others. Two makes *(Hedgshear, Duwel)*, for instance, employ switches of a type that must be held down to stay in the "on" position. When such a switch is released, the motor stops quickly and the blades are no longer a danger. Unfortunately, one of the makes *(Duwel)* that had this type of switch was unsafe electrically.

There is a safety factor involved also in the placement of handles on the tool. If the handle for one hand is placed on the cutting side of the blade, the user must stand on this side which is a potentially dangerous position in the event of accident, if, for example, the operator should slip or fall or something should occur (electrical shock, for example) that would make him start suddenly or lose his balance (see "Safety in the home" section, page 94). A user of a hedge trimmer was killed recently because a power cord was accidentally cut by the cutting blades of the trimmer; the casing thereby became live at full line voltage.

On two hedge trimmers tested *(Central* and *Shopmate)*, the handles could be unscrewed from one side and screwed into the other side All of the trimmers require cleaning and oiling of cutters after each use. Occasional replacement of the gearbox lubricant may be needed

Universal (ac-dc) motors will require new brushes from time to time. It is very important to read and follow carefully the manufacturer's maintenance instructions. If a parts list is supplied, preserve it; you are pretty likely to need it later on. Ratings are cr57.

A. RECOMMENDED

Craftsman, Model 207-17041 (Sears-Roebuck's Cat. No. 9—1704) $42.95, plus postage. Weight, about 6 lb. 12-in. blade. Universal motor rated at 2 amp. 3-wire cord, 8 ft. long, with grounding plug. Well balanced; moderate vibration. The *Craftsman* ranked second choice in CR's use test. Had *UL* label. 2

Little Wonder, Model 16 (Schiller-Pfeiffer, Inc., Southampton, Pa.) $54.40. Weight, about 5¾ lb. 15-in. blade. Universal motor rated at 1.2 amp. This trimmer differs from others tested in that both blades oscillate. 3-wire cord, 5¼ ft. long, with grounding plug. Well balanced; very little vibration. *Little Wonder* was judged easily the best of the trimmers tested in CR's use test. 3

B. INTERMEDIATE

Central, No. C-604 (Central Stamping & Mfg. Co., Polo, Ill.) $29.95. Weight, about 4¼ lb. 10-in. blade. A-c motor rated at 1.8 amp. 2-wire cord, only about 1 ft. long, with no provision for grounding (it is desirable to provide for grounding). Well balanced; vibration somewhat more than average. *UL* label. 1

Shopmate, Model 1301 (Portable Electric Tools, Inc., Chicago 20) $29.95. Weight, without cord, about 4½ lb. 10½-in. blade. A-c motor rated at 1.6 amp. 3-wire cord, about 7 ft. long, with grounding plug. Well balanced; had only moderate amount of vibration. Operation was satisfactory, but this trimmer was more tiring to use than the *A-Recommended* hedge trimmers in CR's use test. *UL* label. 1

Hedgshear, Model 103R (Porter Cable Machine Co., Syracuse 8) $58.50. Very similar to *Hedgshear Model HT* previously tested by CR and given hard use since. Weight, about 6 lb. Universal motor rated at 2.5 amp. 2-wire cord, 10 ft. long, with no provision for grounding (undesirable). Action like that of a chain saw with a chain-type blade running in one direction instead of back and forth. This design provides two cutting surfaces each about 14 in. long, permitting machine to cut in either direction, as desired. 3

Skil Trimmer, Model 512, Type 1 (Skil Corp., Chicago 30) $49.75. Weight, about 5½ lb. 12-in. blade. Universal motor rated at 2 amp. 2-wire cord, about 6½ ft. long, with no provision for grounding (undesirable). Well balanced for holding in the hand; vibration was moderate. Operated satisfactorily in use test but slowed down somewhat under heavy loads. *UL* label. 3

Sunbeam, Model A-1-A (Sunbeam Corp., Chicago) $46.75. Weight, about 4½ lb. 12-in. blade. Universal motor rated at 0.6 amp. 2-wire cord was 9 ft. long, with no provision for grounding (undesirable). Very well balanced in the hand; had considerable vibration. Operated satisfactorily on new growth of hedge but on heavier old growth was somewhat underpowered. 3

C. NOT RECOMMENDED

Duwel HT-100 (Duwel Mfg. Corp., Chicago 8) $39.95. This tool failed to pass the high-voltage test for electrical safety. 2

LAWN SPRINKLERS

Lawn sprinklers are available in many varieties of the several basic types. The basic types include the rotating arm, the oscillating or swinging spray tube, the single jet to-and-fro type, and the fixed or ring type.

Ratings are cr55.

A. RECOMMENDED

Craftsman, No. 6974 (Sears, Roebuck & Co.) $3.83, plus postage. A 4-arm rotating (spinner) sprinkler. 2

Craftsman, No. 6972 (Sears, Roebuck & Co.) $5.43, plus postage. A 2-arm rotating (spinner) sprinkler. 2

Melnor, Model 550 (Melnor Metal Products Co., Long Island City, N.Y.) $8.95. An oscillating lawn sprinkler. Operated by a water motor. 3

B. INTERMEDIATE

Sears, No. 6975 (Sears, Roebuck & Co.) $2.43, plus postage. A 3-arm rotating sprinkler. 1

Green Spot "Rainger" (Scovill Mfg. Co., Waterbury, Conn.) $8.95. A single jet, mechanical rotating sprinkler. 3

Sunbeam, Model K2 (Sunbeam Corp., Chicago) $9.95. A 2-arm rotating (spinner) sprinkler. 3

C. NOT RECOMMENDED

Allenco Ring (W. D. Allen Mfg. Co., N.Y.C.) $1.98. 1

Hubbard (Hubbard Mfg. Co., Minneapolis 2) $4.25. 2

Sherman (H. B. Sherman Mfg. Co., Battle Creek, Mich.) $3.95. 2

UNDERGROUND SPRINKLER SYSTEM

A very important element of a sprinkler system is the use of a vacuum breaker device at the water source to prevent back syphonage of water into the domestic water system of the home. Such backflow, if it occurred, would carry dirt, fertilizer, or poisonous insect sprays or fungicides into the house piping and thus through drinking water faucets.

A. RECOMMENDED

Homart Flex-O-Pipe (Sears-Roebuck's Cat. No. 42—7383) $23.50, plus postage. Sprinkler valve vacuum breaker, $5.25, plus postage. Consisted of 80 ft. of ¾-in. plastic pipe, 8 brass sprinkler heads (flush type), 8 galvanized nipples, 6 brass tees, 2 brass elbows, plastic tee and adapter, metal clamps, pipe joint compound, and installation instructions. *Note:* This system is no longer listed, but the component parts can be purchased separately to allow construction of a system of any size.

MENDERS FOR PLASTIC GARDEN HOSE

CR found two repair kits easy to install and remove (in case one would want to use the mender on another hose) but the *Res-Q* leaked and its steel band rusted. The only tool required to make the repair is a knife, which is used to square the ends of the hose before joining.

Ratings are cr56.

A. RECOMMENDED

Green Spot Dura-Seal Mender (Scovill Mfg. Co., 100 Mill St., Waterbury 20, Conn.) 60c. For 7/16-in. hose. Made of brass. Easy to install, and the repair did not leak at a pressure of 100 lb. per sq. in.

C. NOT RECOMMENDED

Res-Q Plastic Garden Hose Mender (Res-Q Products Corp., Box 211, Van Nuys, Calif.) 49c. For ½-in. hose.

▶ **REF:** Bulletin, July '56.++

HOME OUTDOOR DRINKING FOUNTAINS

These devices are designed to be attached to an outdoor faucet or hose connection to provide drinking water in the yard or garden.

The American Public Health Association recommends a fountain of such design that the water that has come in contact with the lips is prevented from returning to the nozzle. *Camco* was of the desirable design; one called the *Backyard Bubbler* ($4.95) also tested by CR was not.

Rating is cr56.

A. RECOMMENDED

Camco Outdoor Bubbler (Camco Div. of Cambridge Tool & Mfg. Co., Inc., Somerville, Mass.) $3.95. The water flow was delivered in an inclined arc so as to prevent the return of water to the orifice from which the jet was issued (desirable).

▶ **REF:** Bulletin, July '56.++

SNOW REMOVAL EQUIPMENT

CR's tests, though necessarily limited because of inadequate snowfalls at the time of the study, indicated that blower or rotary units generally will not be satisfactory on wet or heavy snow. Some manufacturers of such units recommend that a blade attachment, similar to the common snow plow used on roads, be used on their appliances for wet heavy snow.

Blade type

For listings, see accessories for *Hoe-Trac, Simplicity,* and *David Bradley* garden tractors.

Rotary type

B. INTERMEDIATE

Jari Champion, Model H (Jari Products, Minneapolis 8) $188, plus $46 for snow thrower. The snowthrower attachment converts the unit for snow removal. With light snow, *Jari* did a good job of removal. Did not work satisfactorily with heavier wet snow, 10 to 12 in. deep. The *Jari* was very unpleasant to use, as the snow was blown over the operator.

Toro Snow Hound (Toro Mfg. Corp., Minneapolis 6) $160. A single-purpose unit, not self-propelled. Engine, 4-cycle *Briggs & Stratton,* 2½ hp. On level cement and macadam walks, machine worked well, throwing freshly fallen snow from 8 to 10 ft. It also worked well on snow that had been piled up by shoveling, to a depth of about 15 in. On heavy wet snow, the chute plugged up and had to be cleared before the operation could be resumed. Rotor blades were not guarded.

Snow-melting systems

Valuable references on this subject are: Steel Pipe Snow Melting and Ice Removal Systems, American Iron and Steel Institute, 350 Fifth Ave., N.Y.C.; a section of the 66-page booklet, Radiant Heating with National Pipe available from National Tube Div., U. S. Steel Corp., Pittsburgh, Pa.; a 35-page pamphlet on Snow Melting Systems is available (no charge) from A. M. Byers Co., 1501 Clark Bldg., Pittsburgh.

▶ **REF:** Bulletin, Jan. '56.+

Dampness in basements

There just is no easy or sure cure for damp or wet or seeping cellar walls. The problem is a difficult and variable one, and the treatment required, when one is practicable at all, depends upon many factors. Certainly the "magical product" route using coating materials which are supposed to be applied to the cellar wall by the homemaker, with a brush or spray gun, is not the answer. (*Aquella* and *Coprox* were examples.)

CR's tests have indicated that a coat of Portland cement and sand as a cellar-wall coating worked as well or better than widely-advertised proprietary products. The use of such a coating material is explained in National Bureau of Standards Building Materials and Structures Report BMS95 (1943), Tests of Cement-Water Paints and Other Waterproofings for Unit-Masonry Walls, 30 cents, from the Superintendent of Documents, Washington, D.C.

Sporting goods and camping supplies

Shotguns • rifles • reels for fresh-water angling • boats • outboard motors • binoculars sunglasses • flashlights • emergency lights • portable cooler chests • picnic jugs

SHOTGUNS

The first problem of choice is to select the gauge and choke. Gauge indicates bore diameter, smaller numbers designating larger bores. The size most generally accepted is 12-gauge, while the 16-gauge is probably second choice, for an "all-around" gun. Twenty-gauge guns are light and fast handling, and definitely are not "pipsqueaks" if given proper loads.

"Choke" refers to the degree of constriction at the muzzle of the gun and determines the pattern or spread of the shot.

Unless otherwise noted, the guns listed are 12-gauge in the plain grades, without special accessories, equipped with 28-inch, modified-choke barrels.

All the following ratings of the various types of shotguns are cr57.

Pump-action shotguns

Pump-action or "slide-action" shotguns are likely to be the best choice for the average hunter.

A. RECOMMENDED

Ithaca, Model 37 (Ithaca Gun Co., Ithaca, N.Y.) $95. 4-shot tubular magazine. Push-button safety in trigger guard. Weight, 6¾ lb.

Remington, Model 870 (Remington Arms Co., Ilion, N.Y.) $86. 5-shot tubular magazine. A plug weight is supplied to increase the weight for those who wish it, and to decrease magazine capacity to comply with waterfowl hunting regulations. Push-button safety in trigger guard. Weight, 6¾ lb.

Winchester, Model 12 (Winchester Repeating Arms Co., New Haven, Conn.) $105. Tubular magazine on this sample plugged to three-shell limit. Button safety at rear of trigger guard. 30-in., full-choke barrel. Weight, 7½ lb.

B. INTERMEDIATE

Stevens, Model 77C (Savage Arms Corp., Chicopee Falls, Mass.) $65.75. 5-shot tubular magazine. Button safety on trigger guard. The action was smooth, but trigger pull was too heavy (7½ to 8 lb.). Solid frame (not take-down). Loose and noisy magazine tube and slide. Weight, 7⅛ lb.

C. NOT RECOMMENDED

Mossberg, Model 200KA (O. F. Mossberg & Sons, Inc., New Haven, Conn.) $53. Adjustable choke.

Noble, Model 60 (Noble Manufacturing Co., Haydenville, Mass.) $75.

Semiautomatic shotguns

Semiautomatic guns are somewhat more expensive than pump-action guns of comparable quality, and their functioning may not be as dependable; nevertheless they now are displacing the pump models in the affections of many shooters.

A. RECOMMENDED

Remington, Model 58 (Remington Arms Co., Ilion, N.Y.) $136.50. Three-shot, gas-operated. Safety button on rear of trigger guard shows red when off, but is in sight only when the gun is held bottom side up. (This is a common fault of nearly all pump and semiautomatic guns.) Weight, 7 lb. Judged to be first choice in the group.

Remington, Model 11-48 (Remington Arms Co.) $123. Five-shot, recoiling-barrel mechanism. Safety, same as on *Model 58*. Weight, 7¼ lb. ¶*Remington Sportsman 48,* at same price, is similar except it has three-shot capacity.

Savage, Model 775 (Savage Arms Corp., Chicopee Falls, Mass.) $117. Five-shot, recoiling-barrel. Safety button on trigger guard. Weight, 7 lb.

B. INTERMEDIATE

Winchester, Model 50 (Winchester Repeating Arms Co., New Haven, Conn.) $134.50. Three-shot, inertia-operated type. Full-choke, 30-in. barrel. Safety in trigger guard. Did not seem to point as well as other semiautomatics tested on thrown targets. Point of impact too far from point of aim to be satisfactory. Weight, 8¼ lb. ¶A newer version, using lightweight materials in the receiver, was not included in this test, but is said to give a much better "feel," and be more suitable for upland hunting.

Bolt-action shotguns

Guns of this type that were tested were judged to be satisfactory for the occasional hunter or trapper whose use or abuse of a weapon is such that he would not need to buy an expensive gun.

It is felt that none of the bolt-action guns tested warrant better than a *B* rating and that the selection among them can be largely a matter of personal preference.

B. INTERMEDIATE

J. C. Higgins, Model 583.20 (Sears-Roebuck's Cat. No. 6—098) $32, plus freight. Weight, 7⅝ lb.

Marlin, Model 55 (Marlin Firearms Co., New Haven, Conn.) $36. ¶Similar to *Western Field Model EMN175.*

Mossberg, Model 195KA (O. F. Mossberg & Sons, Inc., New Haven 5, Conn.) $40. Ventilated variable choke. Weight, 7 lb.

Stevens, Model 58 (Savage Arms Co., Chicopee Falls, Mass.) $37. 26-in. full-choke barrel. Weight, 7¼ lb.

Western Field, Model EMN175 (Montgomery Ward's Cat. No. CO—175) $28, plus freight. Weight, 7¼ lb.

Over-and-under double-barreled shotgun

B. INTERMEDIATE

Marlin, Model 90-ST (Marlin Firearms Co., New Haven, Conn.) $140. 30-in. barrels; bottom, modified choke; and top, full choke. Equipped with good rubber recoil pad. Convenient slide safety on top of the pistol grip.

Single-shot models

These guns may be indicated for the less affluent user by the economics of the situation; they are not recommended for the average sportsman. If the single-shot gun must be the choice, the average user should attempt to get one with "modified" or "improved-modified" boring if it is in one of the larger gauges. Full-choke barrels may be indicated for the .410-gauge gun. There is no real advantage in the very long barrels sometimes advertised, and a 28-inch barrel is a good choice.

COMBINATION GUN AND RIFLE

A combination shotgun and .22 rifle may be quite useful around the farm, ranch, or country estate, for shooting vermin. It may also appeal to the squirrel and turkey hunter. The .410-gauge shotgun is inadequate for most game birds except at short range, and should not be used on them beyond 30 yards.

A. RECOMMENDED

Savage, Model 24 (Savage Arms Corp., Chicopee Falls, Mass.) $41.50. Over-and-under hammer gun with .22 long-rifle, rim-fire rifle barrel on top and .410 shotgun barrel, chambered for 3-in. shells, underneath. Barrel length, 24 in. Weight, 6½ lb.

▶ **REF:** Bulletin, Oct. '57+++, Dec. '57+++.

LOW-PRICED DEER RIFLES

These are mass-produced by major arms companies and list at prices under $100. The calibers considered are those usually used in these rifles, and the ammunition is of the type or types obtainable in any part of the country.

Short- or medium-range rifles

A. RECOMMENDED

Marlin, Model 336-A • **Marlin, Model 336-C** • **Winchester, Model 94.**

B—

Savage, Model 340-B.

Longer-range rifles

A. RECOMMENDED

Remington, Model 721-A • **Remington, Model 722-A.**

▶ **REF:** Bulletin, Sept. '56.++

.22-CALIBER RIFLES

All rifles tested were bolt action, clip magazine repeaters, and were chambered for short, long, and long rifle cartridges. Two of each make were tested. Ratings are cr52.

A. RECOMMENDED

Remington Scoremaster, Model 511P.

B. INTERMEDIATE

Marlin, Model 80DL • **Mossberg, Model 144LS** • **Savage, Model 4.**

C. NOT RECOMMENDED

Stevens, Model 84 • **Winchester, Model 69.**

▶ **REF:** Bulletin, Oct. '52.+++

RIFLE SIGHTS

Rear gun sights

A. RECOMMENDED

Lyman, Models 57 and 66. $8.50. Has ¼-min. adjustments for elevation and windage. (*Model 57* fits bolt action rifles; *Model 66* fits flat sided rifles.)

Redfield, Model 80. $7.50. Micrometer adjustment.

Telescopic sights

A. RECOMMENDED

Boone Gunscope • **Lyman All-American** • **Weaver K2.5** • **Weaver K4.**

▶ **REF:** Bulletin, Oct. '56.++

AIR PISTOLS

Ratings are cr55.

A. RECOMMENDED

Benjamin Franklin, Model 132, .22 Caliber. $20. • **Crosman, Model 130, .22 Caliber.** $9.95.

B. INTERMEDIATE

Marksman, .177 Caliber. $5.95. No safety lock. Be sure barrel is latched before firing.

C. NOT RECOMMENDED

Heym, 4.5 mm. (.177) Caliber. $4.95, including 100 pellets. No safety lock.

▶ **REF:** Bulletin, Jan. '55.++

TOY PISTOL

C. NOT RECOMMENDED

Kruger Toy Pistol. Widely advertised for a long time in popular magazines at $3. Made largely of plastic. A dangerous toy. Accuracy was very poor.

▶ **REF:** Bulletin, July '54.+

REELS FOR FRESH-WATER ANGLING

Rotating-spool reels

Rotating-spool reels are the long-time familiar type of bait-casting reels noted for occasional backlashes (snarled line on spool) for the experienced angler, and numerous backlashes for the inexperienced. Spool brakes, now in general use, make this less of a problem. The reels listed are without drags, except as noted.

A. RECOMMENDED

For all fresh-water fishing

Green Hornet, No. 2200 (Bronson Reel Co., Bronson, Mich.) $7.95.

Heddon Pal, No. P41 (James Heddons Sons, Dowagiac, Mich.) $14.95.

Peer Monofil, No. 109F (Penn Fishing Tackle Mfg. Co., 3280 W. Hunting Park Ave., Philadelphia) $12. Has star drag.

Peerless, No. 9F (Penn Fishing Tackle Mfg. Co.) $13.50. Has star drag.

South Bend, No. 1000 (South Bend Tackle Co., 625 High St., South Bend 23, Ind.) $17.95. Shakespeare line of reels runs closely parallel.

Streamlite, No. 310 (The Langley Corp., 310 Euclid Ave., San Diego 14) $15.

Supreme, No. 1573, $37.50; **Akron, No. 1893,** $12.95. (Both by Enterprise Mfg. Co., Akron 9, Ohio)

For casting artificial lures

Ambassadeur (The Garcia Corp., 268 Fourth Ave., New York 10) $45.

Lurecast, No. 330 (The Langley Corp.) $16.50. Has narrow spool.

Pal P41N (James Heddons Sons) $16.50. Has narrow spool.

President, No. 1970A (Shakespeare Co., Kalamazoo, Mich.) $32.50. South Bend line of reels runs closely parallel.

Fixed-spool (or spinning) reels

With this type of reel, which is coming into great favor nowadays, the reel and its spool are essentially stationary during casting, and the line slips off the end of the spool in much the same way as thread can be pulled from the end of a spool held fixed in the hand. These reels are suited for relatively light lines only. Their use eliminates backlashes, allows casting greater distance in casting with light lines and lures, and has other advantages as well as some disadvantages. Spinning reels are of two general types, open-face and enclosed-spool.

Open-face spinning reels

A. RECOMMENDED

Alcedo Micron (Distributed by Continental Arms Corp.) $41.50.

Larchmont, Model 312 (Airex Corp.) $29.95, including 100-yd. line.

Mitchell, Model 300 (*Model 301* is left-hand reel) (The Garcia Corp.) $32.50.

Pelican, Model 1020 (*Model 1020-A* is left-hand reel at same price) (Enterprise Mfg. Co.) $24.95. Drag, exceptionally smooth, but drag adjustment while playing fish may be excess baggage.

Spinpal, Model 260 (James Heddons Sons) $25. Automatic full-bail pickup goes into position to cast by reverse turn of handle; start of retrieve returns it to "wind in" position. Suitable for any angler. ¶Furnished in manual pickup in *Model 240* at $19.95.

B. INTERMEDIATE

Differences between these and the *A-Recommended* reels lie in less smooth operation and finish. The three named below are less expensive and may be considered in the category of a spare reel or a reel for the novice fishing companion or youngster.

Pfleuger Freespeed (Enterprise Mfg. Co.) $14.95.

Trimline, Trim Spin Model (Trimline Tackle Co., Inc.) $5.98.

True Spin, Model 340 (American Tackle & Equipment Co.) $17.95.

Enclosed-spool spinning reels

These are the reels that bring spinning-type fishing into the reach of thousands of fresh-water anglers who would not warm up to the open-face spinning reel. The cone and small aperture, from which the line emerges on the cast, prevent billowing and attendant "casting loops" sometimes produced with open-face spinning reels.

A. RECOMMENDED

Abu-Matic 60 (Imported from Sweden; distributed by The Garcia Corp.) $29.75. Precision built, with built-in anti-reverse. One-handled crank. Star drag, exceptionally smooth. A rubber line-brake adds to smoothness, lowers line wear. Thumb control well placed and positive in action.

Pfleuger 88 (Enterprise Mfg. Co.) $19.95. Extended cone should prevent line wear despite questionable claim of greater casting distance. Pickup pin for line is Carboloy. Drag works smoothly after adjusting on top of reel. Single handle crank. Anti-reverse. Gear ratio of 2⅔ to 1 would be unsatisfactory for some anglers accustomed to the 4 to 1 ratio of most rotating-spool reels.

Spincast 77 (South Bend Tackle Co.) $19.95. (New *Spincast 88,* $23.95, is identical except that it uses Carboloy pickup and heavier lines.) Another excellent enclosed reel with smooth operation. Flick-of-thumb anti-reverse. Line drag tension pre-adjusted by turning cone. Drag operation, reasonably smooth. One-handled crank.

Wondercast, Model 1775 (Shakespeare Co.) $19.95. To all intents and purposes, identical in appearance and function with *Spincast 77.*

Zebco, Model 33 (Zebco Co.) $19.50. New 1958 model with "feathertouch" control and smooth drag. Only necessary to depress the thumb control fully to prepare for casting, release to cast, and depress if it is desired to stop flight of lure. Carboloy pickup. Two-handled retrieve will have familiar "feel" to bait caster. Rate of retrieve, satisfactory. Operation, smooth. (This also applies to *Zebco Scottee 66,* $12.95.) Both have thumbscrew drag tension adjustment.

B. INTERMEDIATE

Johnson Century, No. 100 (The Denison-Johnson Corp.) $17.95. Primarily the same as *Citation 110* except for lighter lines and with 18½ in. per turn retrieve.

Johnson Citation, No. 110 (The Denison-Johnson Corp.) $22.95. For heavier lines up to 10-lb. test.

Trim-Cast (Trimline Tackle Co., Inc.) $9.95.

▶ **REF:** BULLETIN, Apr. '58.+++

BOATS

No boat can be "best" for all users, and suitability of design for the intended type of use is likely to be more important than quality differences among hulls of the same design type.

The buyer who chooses his hull design and construction material wisely for his needs is likely to get satisfactory service from any hull listed here. Transportation charges are high; shipping distance from builder to place of use thus may be an important factor in selection of a brand.

Boats made of aluminum used in salt water should be painted, using a zinc chromate primer. Their seams and spot-welded joints should be properly protected against corrosion. To obtain a good bond, the boat should be used in salt water before painting, for two or three weeks, to etch the surface of the aluminum.

Zinc chromate primers should never be used on aluminum boats used in fresh water, as the primers tend to pick up moisture, resulting in blistering. Anti-fouling bottom paint should never be used directly on an aluminum boat.

Fishing craft

For car-top transport

Penn Yan Standard Cartop, Model WXH (Penn Yan Boats, Inc., Penn Yan, N.Y.) $212. Canoe-type construction, except that plastic is used instead of canvas.

For trailer transport

Dunphy Trout (Dunphy Boat Corp., Oshkosh, Wis.) $321. Molded-plywood construction.

Non-portable

Amesbury Skiffs (A. Parsell, Seaview Ave., Bridgeport, Conn.) Well made, but rather roughly finished.

B.B. Aristocrat, Bait-Caster, Sportsman (Beetle Boat Co., Inc., New Bedford, Mass.) $799.90, $695.95, $762.85, respectively. Molded plastic construction.

High-speed craft

For trailer transport

Lone Star Commander (Lone Star Boat Mfg. Co., Inc., Grand Prairie, Tex., and Bremen, Ind.) $298. Aluminum construction.

Penn Yan Swift, Model CTT (Penn Yan Boats, Inc., Penn Yan, N.Y.) $364. Construction similar to *Penn Yan Standard Cartop.*

General purpose craft

For car-top transport

Duratech Pramline, Model 93 (Duratech Mfg. Corp., Pleasantville, N. Y.) $179. Aluminum construction.

Rye Pram (Rye Boat Co., Rye, N. Y.) $99.95 unpainted, $155 painted. Sheet-plywood.

Non-portable

Amesbury Skiff (see listing under "Fishing craft").

Cape Cod Stormy Petrel (Cape Cod Shipbuilding Co., Wareham, Mass.) $585. *Fiberglas* construction.

Rye Cork (Rye Boat Co., Rye, N. Y.) $325 painted, $274 unpainted. Plywood construction.

Thompson Sea Skiff (Thompson Bros. Boat Mfg. Co., Peshtigo, Wis., and Cortland, N. Y.) $495. Lapstreak construction.

▶ **REF:** BULLETIN, May '56.+++

OUTBOARD MOTORS

There is an increasing demand for the larger, higher-horsepower outboard motors. Prospective purchasers should have it in mind that increased horsepower may not greatly affect top speed performance. The most noticeable effect is likely to be improved pulling power, which is most needed on the larger boats. Don't succumb to "horsepower fever." If you can obtain a satisfactory boat speed by running a moderate-horsepower motor at nearly full throttle, you would be wasting money for both motor and gasoline if you buy a more powerful motor and run it at a reduced throttle setting. The 30- to 33-horsepower motors tested were so heavy that two or more persons would be required to carry one.

Motors in the 35- to 50-horsepower class were reported in the July 1958 BULLETIN.

A. RECOMMENDED

Evinrude, Big Twin Electric 30 (Evinrude Motors, Milwaukee 16) $562.

Johnson Sea Horse 30 (Johnson Motors, Waukegan, Ill.) $462.

Mercury Thunderbolt, Mark 30E (Kiekhaefer Corp., Beaver Dam, Wis.) $486.

Scott-Atwater Bail-a-matic (Scott-Atwater Mfg. Co., Inc., Minneapolis 13) $470.

▶ **REF:** BULLETIN, July '56.+++

SMALL LIFE PRESERVER

B. INTERMEDIATE

Floto (Lucas Mfg. Co., 4156 N. Lowell Ave., Chicago 41) $3.95, plus $1 for each recharge. An inflatable life preserver, 5½ x 3½ x 1½ in., which will provide buoyancy for one adult.

MARINE VARNISH

One of the best marine spar varnishes is made from pure, undiluted para-phenylphenol-formaldehyde resin. The varnish is to be applied to bare wood, not over a previous coating of some other varnish. Once applied it can be renewed as needed without removing previous coatings. Varnish of this type is made by the Brooklyn Varnish Manufacturing Co., Inc., Brooklyn 1, N.Y., which sells it under the name *Kauri Gold Band Spar Varnish.* Another effective varnish is *Mautz* 100 percent phenol-formaldehyde resin varnish made by Mautz Paint & Varnish Co., 615 E. Washington Ave., Madison, Wis. (Retail price, $1.28 in pints and $2.31 in quarts.)

There is no difference between fresh and salt water in requirements for varnish coatings.

Incompatibilities exist among varnishes as among paints. Thus a very good varnish may fail within a few weeks if applied over a previous coating of another type of varnish.

ICE SKATES

Figure skates are the best type for beginners. Skate shoes should fit tightly over *thin* socks. (Wool socks of medium weight may be worn when fitting skating shoes for growing children, so the shoes will fit satisfactorily a little longer, when the socks are later changed for thinner ones.) An article on figure skates, including ratings of brands, will appear in a monthly CONSUMER BULLETIN in the fall or winter of 1958.

TENNIS BALLS

Tests were made for compliance with International Lawn Tennis Federation specifications both before and after artificial aging. Wear tests were done by tumbling in a large drum, lined with abrasive material. Consumers' Research has been informed that some of the brands which received different ratings were actually made by the same manufacturer without any known difference in condition of manufacture. Thus it may be that storage time—even with the balls in sealed cans—is an important factor in the condition and behavior of balls; it would seem a wise precaution to buy balls, when practicable, from a dealer whose stock turns over rapidly. All brands listed came in sealed cans except *Olympic.*

A. RECOMMENDED

Cortland • **Dunlop** • **MacGregor** • **Pennsylvania X-76** • **Wilson** • **Wright & Ditson.**

B. INTERMEDIATE

J. C. Higgins • **Spalding** • **Victor.**

C. NOT RECOMMENDED

Olympic.

▶ **REF:** BULLETIN, July '57.++

SWIMMING POOLS

There are several types of pools suitable for construction in excavations: sprayed concrete (Gunite process), poured concrete, steel tank, flexible plastic liner over wood plank wall or concrete blocks. There are also pools made with concrete blocks and some of molded plastic.

Nowadays it is fairly common to use an electric water pump and a "vacuum cleaner" hose arrangement to clean a pool. With an electrically driven pump at the pool side, there may be a dangerous shock hazard, especially if the motor used is not fully enclosed and waterproofed and especially designed for the job. The use of an electric pump should be limited to hours when no one can possibly have access to the pool. The frames of the motor and pump should be securely connected to a good electrical ground, and under no circumstances should a portable electric pump be left connected to a live electrical circuit when the pool is in use even if the pump switch is in the off position. (Someone in the pool may be electrocuted.)

▶ **REF:** BULLETIN, dangers from pool pumps, June '57++; pools set in excavations, June '58+++; above-ground and inflatable pools, July '58+++.

BINOCULARS

Binoculars are designated by power and diameter of the objective lens; "6x30" describes a six-power glass with objective lenses 30 millimeters across. Most persons will find a six-power glass with an objective diameter of at least 30 millimeters best for general use.

The 7x50 binocular is a fine glass for night use but has the disadvantage of large size and weight. The 7x35 is a very good compromise and is the choice of most discriminating users. The 8x40 binocular suffers from being somewhat high in magnification for many uses.

Standard 7x50 binoculars are suitable for observing satellites which are too faint to be seen with the unaided eye, if all other conditions are favorable. They have sufficient light-gathering power and a field of view of about 7 degrees, which is adequate for following the satellite once it is located in the sky.

Some binoculars have a central-focus device with the right eyepiece having its own focus adjustment; others have separate focusing for each eye. The latter type is usually cheaper and sturdier, but a central adjustment can be operated more quickly. *All* of the optical surfaces in contact with air (10 or more per barrel) should be coated with a non-reflective film.

Some simple tests of binoculars include: (1) With the instrument adjusted and focused, look at a distant object of fine detail. The image should be sharp and show no color fringes, and vertical and horizontal lines should be equally sharp. (2) Look steadily through the binocular for 30 seconds, then directly at the same object, and vice versa. There should be no double images or difficulty of focusing. (3) With eyepiece end pointed toward a 60-watt lamp, examine through the objective lens for dirt or moisture inside. (4) Shake the binoculars, and listen for loose parts. (5) Try hinge for smooth action.

Consumers' Research purchased for $4.90 a cheap "imitation" of a prism glass from a mail-order firm known as Thoresen Inc., New York City, which is a big advertiser in newspapers and popular magazines. The optical quality was poor, as may be expected for all glasses which imitate the outward appearance of true prism binoculars. Imitations of good binoculars can be distinguished by the fact that the axis (center line) of the objective lens is in direct line with the axis of the eyepiece although there is a bulge intended to simulate a prism housing. In prism glasses, the two center lines of the lenses in a single barrel are not in line.

Another mail purchase of a different quality product is described below:

Binolux Prism Binocular (Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N.Y.) $20.95 plus $2.10 federal excise tax, plus postage, including pigskin-covered case and straps. Made in Japan. 7x35, center focus. Field of view at 1000 yd., 341 ft. All optics were coated. Fairly well made. Satisfactory for infrequent use if not subjected to hard usage. Acceptable for sporting events and bird watching as well as yachting. Available with individual-eyepiece focusing at $17.95, plus $1.80 federal excise tax. ¶This brand is sold in some department stores.

▶ **REF:** BULLETIN, Feb. '58+++, May '58+.

TELESCOPES

Telescopes are basically dependent for good performance on the quality of their optics—lenses, and sometimes mirrors. These parts are hand-finished, and quality can vary widely from instrument to instrument of the same brand. A trial period with privilege of return for full refund is thus very important, and an instrument should be tested by an experienced person.

All telescopes require skill in adjustment and use, but this is *much* more important with reflecting telescopes than refracting instruments. Reflectors in general give more light-gathering power per dollar of cost, but require greater skill and care in use than refractors. The mounting of a telescope is an important matter that requires just as careful consideration as the optical qualities of the instrument.

A. RECOMMENDED

Sky-Scope (Skyscope Co., Inc., 475 Fifth Ave., New York 17) $29.75. Finder and mounting, $7.50. A reflecting telescope with 3½-in. mirror and eyepiece. Over-all magnification of 60. Use of the finder recommended for objects other than the moon and the planets.

▶ **REF:** BULLETIN, May '51.+

SUNGLASSES

For sunglasses, lenses of a neutral shade (gray) are best for many purposes, because they do not change the color of objects observed. Very dark sunglasses should be avoided for driving, and lens colors which might tend to make it difficult to distinguish the colors of traffic signals must be avoided. Green lenses give maximum glare protection. Yellow lenses give *no* glare protection, but have an effect, largely psychological, of sharpening details on dull hazy days. Sunglasses should never be worn indoors or at dusk or at other times when they are not needed.

Glasses should be chosen with frames of the proper size, so that the eyes are approximately behind the centers of the lenses.

Sunglasses which are worn only occasionally need not be of high optical quality. However, undue distortion in lenses can be annoying and, if too great, can be harmful. Most of the sunglasses selling for $1 or less were found in tests by CR to have noticeable distortion. Distortion can be detected by viewing straight parallel lines against a bright background through the lenses held a few inches from the eyes. The lenses should be moved about and rotated. If no distortion of the straight lines is noticed, the optical quality is satisfactory.

Plastic lenses are easily scratched and thereby lose a part of their transparency.

A. RECOMMENDED

American Optical Deluxe • Calobar C12-50 • Cosmetan • Cosmetan-Polaroid • Ray-Ban • Ray-Ban with Gradient Density, Cat. No. 6A8307 • Ray-Ban with Top Gradient Density, No. 6A7307 • Solarex 650 • Willson G249 • Willson G820 • Willson MP60 • Willsonites G80.

B. INTERMEDIATE

Fosta Certified Safe Lens • Willson Y11C • Willson G16 • Zephyr, No. 78L.

* * *

Less desirable than preceding *B*-rated glasses:

Columbia Protektosite • Fosta 6018 • Fosta 1497 • Protex.

▶ **REF:** Bulletin, July '55.+++

PINHOLE SPECTACLES

C. NOT RECOMMENDED

Stenopeic Glare Guard Spectacles (Sunset Glare Guard Corp., Palm Springs, Calif.) $18.50. Opaque black plastic "lenses," each with 48 pinholes to see through. Advertised to give better vision and relief from various eye discomforts, but should not be worn except on the advice of a medically qualified eye practitioner.

▶ **REF:** Bulletin, Feb. '57.++

SAFETY GOGGLES AND GLASSES

Use of eye-protecting glasses or goggles with lenses made from shatter-resistant glass or plastic is a sensible precaution in many situations—as in the home workshop or when one is using or is close to a rotary lawn mower or edger that can hurl pebbles or dirt. For youngsters, and for active adults who wear glasses, corrective lenses can be obtained in shatter-resistant glass at an extra charge.

FLASHLIGHTS

Some important qualities to look for in a flashlight are: (1) bright, well-polished reflector; (2) strong body with threaded parts that fit well; (3) a case that opens at both ends for convenience in battery removal; (4) a clear lens with a protecting rim around it; (5) a case that doesn't roll too easily; (6) a uniform spot of light which doesn't flicker when the flashlight is shaken; (7) a switch that is not difficult to use but is not likely to be turned on accidentally. Brass or copper cases are considered more desirable than those of other materials. Unusual or novel types of flashlights should be avoided, including flashlights that contain a hand-powered dynamo or generator.

A. RECOMMENDED

UsaLite Red-Head • Winchester Bond.

B. INTERMEDIATE

Eveready Masterlite, No. 7251P • Gits, No. A122 • Gits, Model A-144 • Ray-O-Vac • Ray-O-Vac Handyman • Usalite Swivel-Head • Ward's Anglers' Special • Ward's Mechanics' Shockproof.

C. NOT RECOMMENDED

BMG • Eveready, No. 5251P • Hipco • UsaLite • Western Auto.

Rechargeable flashlights

B. INTERMEDIATE

Gould Multi-Lite, No. 2DRF-2 (Gould-National Batteries, Inc., 35 Neoga St., Depew, N.Y.) $19.95, including battery and charger to be used on 115-volt a.c.; $14.95 with charger for use with an automobile battery. Rolls too easily. Light output, good. Has the disadvantages that it cannot be recharged when electric power is not available, and recharging takes 12 hr., whereas new batteries can be put in a standard flashlight in a few seconds. ¶*Model 2DRF-3* is similar except case, made of fiber with neoprene ends, does not have tendency to roll, and the switch has no provision for flash operation.

C. NOT RECOMMENDED

Remington Charge-A-Lite (Remington Rand Electric Shaver Div., Sperry Rand Corp., Bridgeport 2, Conn.) $7.95. Plastic case and lens. Built-in charger renews batteries when the flashlight is plugged into an a-c outlet, but light tested became ineffective after about 20 charge-discharge cycles.

▶ **REF:** Bulletin, July '57.+++

Flashlight batteries

In CR's tests, some batteries lost up to 40 percent of their useful performance while in storage for a period of 12 months. Storage in a cool, dry place helps prolong a battery's life. Batteries in flashlights and radios and in instruments should be examined frequently and discarded if leaking or swelling. *Photo-flash batteries,* designed for high current output rather than long life, are not suited for use in flashlights.

A. RECOMMENDED

Burgess, No. 2 ● **Eveready, No. 950.**

B. INTERMEDIATE

Bright Star, No. 10M ● **General** ● **Homart, No. 4650** ● **Ray-O-Vac, No. 2LP.**

C. NOT RECOMMENDED

Ward's No. 62-23 Airline A-Battery ● **Wizard, No. 3B6733.**

▶ **REF:** Bulletin, Aug. '53.++

EMERGENCY LIGHTS

The great danger in making on-the-road automobile repairs at night can be minimized by being prepared in advance with flares or blinker lights with which to warn other motorists.

The most versatile type is the combination of a lantern-type flashlight with a red blinker that can be operated separately or simultaneously. However, most such lamps have the disadvantage that if the white light is needed for trouble shooting under the hood, the warning light would not be seen by approaching drivers.

A. RECOMMENDED

Burgess Radar-Lamp (Burgess Battery Co., Freeport, Ill.) $6.50, plus $2.45 for special battery.

Burgess Radar-Flash TW-34 (Burgess Battery Co.) $3.95, plus $2.45 for special battery. A red flasher light only, which uses the same kind of battery as the *Radar-Lamp* above.

Do-All Snapit (Cable Electric Products, Inc., Providence 7, R. I.) $6.95, plus 6-volt lantern battery (about 80c). Combination white light and red blinker, with the white light on a reel with a 25-ft. extension cord. The white light operates at low efficiency; would be *B. Intermediate* if for use as a flashlight only.

B. INTERMEDIATE

Big Beam, No. 164 (U. C. Lite Mfg. Co., Chicago) $8.95, including battery. Would be *A. Recommended* if for use as a spotlight only.

BMG (Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.) $3.98, plus four size D batteries.

Ecolite (Economy Electric Lantern Co., Inc., Sturgeon Bay, Wis.; Sears-Roebuck's Cat. No. 34—4815) $5.98, plus postage, including 6-volt lantern battery.

Homart Brite-Beam (Sears-Roebuck's Cat. No. 34—4832) $7.95, plus postage, including 6-volt battery. Would be *A. Recommended* if for use as a spotlight only.

Radar-Lite, Model TW3 (Burgess Battery Co.) $9.50, plus $2.45 for battery. Red flasher and white light. Would be *A. Recommended* if for use as a spotlight only.

Road Flare (McKenzie Products, New York 14) 89c for four cardboard boxes containing combustible material.

Warn-O-Flash (Safety Warning Signal Co., Brooklyn 30, N.Y.) $3.95 for 6-volt auto systems, $4.95 for 12-volt. Flexible translucent red plastic shell containing a flasher and light bulb with a 7¾-ft. cord leading to the car's cigarette lighter. Draws 1 amp. from the car's battery. The translucent plastic does not transmit as much of the light as would be desirable.

C. NOT RECOMMENDED

Crown ● **Redi-Flash.**

▶ **REF:** Bulletin, Dec. '56+++, Apr. '57++.

PORTABLE ALCOHOL STOVE

A. RECOMMENDED

Turm-Sport (Made in West Germany; distributed by Larchmont Import Traders, 11 Addison St., Larchmont, N.Y.) $8.95, postpaid. A small portable stove, handy for campers, picnickers, and occasionally in the home as emergency means of cooking in case of power failure. Compact, easy to use. Denatured alcohol fuel is much safer to use than gasoline in pressure stoves frequently sold to campers and sometimes to householders. Folds to 7¼ x 5½ x 2¾ in. Weight, 1 lb. 13 oz., plus 8 oz. of fuel. Accommodates a 10-in. diameter pot. Brought 1 qt. of 60-degree water to a boil in 9 min.

PORTABLE COOLER CHESTS

Ratings are cr55. (Price ratings on a per-cubic-foot basis.)

A. RECOMMENDED

Cooler Chest (Reiber Cooler Co., Inc., Indianapolis 5) $12.95. Interior, galvanized steel. 1.0 cu. ft. Drain plug. 2

Western Field (Montgomery Ward's Cat. No. 60—9591M; manufactured by Cronstroms Mfg. Co., Minneapolis 6) $19.45, plus postage. Interior, aluminum. 1.6 cu. ft. Well made, but soft aluminum exterior was susceptible to damage. 2

B. INTERMEDIATE

J. C. Higgins (Sears-Roebuck's Cat. No. 6—07411) $12.46, plus postage. Interior, galvanized steel. 0.8 cu. ft. Objectionably sharp corners. ¶Also marked *Thermaster,* Poloron Products, Inc. 2

Cronco Port-o-Rator, Model 12-I.H. (Cronstroms Mfg. Co.) $14.95. Interior, aluminum. 0.9 cu. ft. 3

Kampkold, Model 1K-2S (American Gas Machine Co., Div. Queen Stove Works, Inc., Albert Lea, Minn.) $18.95. Interior, aluminum. 1.1 cu. ft. 3

Skotch Kooler, No. 404 (Hamilton-Skotch Corp., Hamilton, Ohio) $8.59. Interior, steel. 0.5 cu. ft. 3

C. NOT RECOMMENDED

Carlco Pic-Nik, Model 12 • Progress, Model A1 • Thermaster, Cat. No. 341 • Vagabond, No. 9023.

▶ **REF:** Bulletin, July '55.++

PICNIC JUGS

For keeping small amounts of foods hot or cold, a vacuum bottle is *far* more efficient than any picnic jug, and two or more vacuum bottles may be used to advantage, if necessary. Ratings are cr56.

A. RECOMMENDED

American Beauty, No. AB 401 • J. C. Higgins, No. 7357 • J. C. Higgins, No. 7358 • Little Brown Jug, Yeeround No. 9205-S • Skotch Jug, Model 212 • Thermos, No. 7747.

B. INTERMEDIATE

Columbian Bonnie, No. 37B • Columbian, No. A38 • Feather Flite, Model A-32 • Feather Flite, Model A-33 • Little Brown Jug, No. 9201-S • Revelation, Model 7G5236 • Revelation, Model 7G5242 • Therm-a-Jug, Model 48-516 • Therm-a-Jug, Model 48-517.

C. NOT RECOMMENDED

Champion, No. 8S • Thermaster, Model 336 • Western Field, No. 732 • Western Field, Model 733.

▶ **REF:** Bulletin, June '56.+++

"CANNED ICE"

A number of products are sold as "ice substitutes"; most of these claim to be many times more effective than ice itself. These products are priced at 29 to 98 cents per pint container and are to be frozen in a refrigerator or freezer, then used as ice would be. They may be refrozen and re-used many times.

Several ice substitutes tested were found to be equivalent in effect *to an equal weight of ordinary ice* (as was to be expected), and the advertising claims as to efficiency were found to be grossly exaggerated. There is no substance that can be used for this purpose that has cooling properties superior to those of old-fashioned ice made from plain water. Disregarding label instructions "Never open this can," chemists opened some cans of one brand and found the contents to be rusty water.

The consumer who wishes this form of "dry" cooling can make his own "canned ice" by freezing milk cartons filled almost full with water.

Aquarium pumps

It is important in purchasing an aquarium pump to select one that delivers sufficient air to operate all the equipment to be used with it. Too small a pump will obviously be unsatisfactory, and with too large a pump, back pressure will be excessive and the life of the pump will be shortened. As a rough guide, it can be assumed that an outside filter requires about 20 cubic inches of air per minute, and air stones, about 4 to 5 cubic inches each.

Piston pumps

A. RECOMMENDED

Typhoon (Maihof Engineering Products, Avenel, N. J.) $16.60. 1

Cosmic, Model 711E (New Rochelle Mfg. Co., 207 Washington Ave., New Rochelle, N. Y.) $21. 2

Marvel Airflow, Model B (Magnus Mfg. Co., 6 S. Franklintown Rd., Baltimore 23) $28.35, complete with pressure tank and gauge. 2

Supreme Airmaster (Eugene G. Danner Co., Brooklyn 27, N. Y.) Approximately $21. 2

Marco, Model B2 (J. B. Maris Co., Bloomfield, N. J.) $38.50. 3

Marco, Model 25 (J. B. Maris Co.) $30. 3

B. INTERMEDIATE

Cosmic Tom Thumb, Model 711B (New Rochelle Mfg. Co.) $16. 1

Metal Frame Silver Streak (Metal Frame Aquarium Co., Pine Brook, N. J.) $19.15. 1

Marco, Model A (J. B. Maris Co.) $27.50. 2

Vibrator pumps

B. INTERMEDIATE

Super Aqua-Air (Aqua Air Products, 1527 N.W. 79 St., Miami 47) $9.95. 2

Thiberg Aerator, Model 1 (Geo. A. Thiberg, Cedar Knolls, N. J.) $10. 2

C. NOT RECOMMENDED

Chic (The Scottish Fisheries [America] Inc., 297 Mercer St., N. Y. C.) About $5. 1

Saxon, Model A (Saxon Plastics Corp., 454 Broome St., New York 12) $7.95. 2

▶ **REF:** Bulletin, Jan. '58.+++

Sewing machines

The selling of sewing machines has become such an aggressive and competitive business that the consumer would be well advised to acquire some basic information before she goes shopping. A straight-sewing machine does very satisfactory work and will probably be the best buy for the occasional sewer. A zigzag attachment is available for most straight-sewing machines and it will do a satisfactory, though simple, zigzag stitching job.

Straight-sewing machines may have a long bobbin which travels back and forth in a shuttle at the end of an arm. This kind of mechanism is noisier than a round-bobbin mechanism, and, because of vibration, is not so suitable for electric-powered sewing machines.

Zigzag machines are classified in the trade as either full-zigzag or semi-zigzag machines. The basic difference between these two kinds is that the needle of the full-zigzag machine can swing from the normal center line of stitching to either side, while the semi-zigzag limits its patterns to only one side of the straight stitch line.

An automatic machine of either of these kinds has a built-in mechanism that controls the path of the stitch and thus makes the pattern. Nonautomatic machines must be controlled manually. One of CR's experts notes that manually controlled machines often fail to satisfy when stitching ornamental patterns, unless the user sews enough to keep in practice. As a result, the manually-controlled machines are too often used only for straight seams and for plain zigzag stitching. Automatic machines cost anywhere from $50 to $100 more than the non-automatic zigzag machines.

In buying any sewing machine, ask for a guarantee and be sure that the guarantee form is not only signed by an authorized dealer but that it will be registered with the manufacturer, or his agent in this country.

Be sure also that you fully understand the service agreement. Your machine should require little servicing if you follow instructions for adjusting it and keeping it cleaned. A straight-sewing machine that is properly made will last for many years and will almost never wear out in home use, although it will need cleaning and overhauling from time to time. Zigzag machines, because of the complexity of the parts, require careful maintenance.

Confusion sometimes results from conflicting claims regarding the interchangeability of certain parts of foreign- and American-made machines. Some parts are interchangeable, but sometimes the foreign-made machine lacks the precise machining necessary to a satisfactory fit, so that the American-made part that should fit the machine does not do so.

The Brewer Sewing Supplies Co., 305 W. Adams St., Chicago 6, claims to have parts for about 95 percent of the imported machines now being sold.

Some of the machines listed have been superseded by a newer type, or are no longer made. Nevertheless, the consumer may find them in stores, since many dealers still have machines which happen to be out of production at this time.

Automatic zigzag machines

All were full zigzag machines (needle can swing from the normal center line of stitching to either side). Some of these machines were more versatile than others. For a detailed discussion of the kinds of patterns that can be made by zigzag machines, see November 1955 BULLETIN article "Zigzag sewing machines."

A. RECOMMENDED

Bell-O-Matic 501 (Bell Portable Sewing Machine Corp., Freeland, Pa.) $300.

Brother Pacesetter, Model 200FZ2 (Brother International Corp., 122 W. 27 St., New York 1) $339 for portable in airplane luggage case; $469.50 in cabinet. Made in Japan.

Elna Supermatic (Necchi Sewing Machine Sales Corp., 164 W. 25, N.Y.C.) About $305. Free-arm head.

Morse Duomatic, Model TZ50 (Morse Sewing Machine & Supply Corp., 122 W. 26 St., New York 1) $319. Made in Japan.

Necchi Supernova (Necchi Sewing Machine Sales Corp.) About $340.

Pfaff Automatic 230-260 (American Pfaff Co., 373 Fifth Ave., New York 16) $330.

Pfaff Automatic 332-260 (American Pfaff Co.) $340.

Singer 306 (Singer Sewing Machine Co., Singer Bldg., 149 Broadway, New York 6) $330 up.

Singer 319 (Singer Sewing Machine Co.) $340.

Singer Slant-O-Matic, Model 401A (Singer Sewing Machine Co.) $378 to $450 in console cabinets or desks. Had slanted needle.

Viking, Type 21 (Consolidated Sewing Machine Corp., 1115 Broadway, New York 10) $290.

B. INTERMEDIATE

Adlermatic 189A (Adler of America, Inc., 15 Exchange Place, Jersey City 2, N. J.) $320.

Adlermatic 153A (Adler of America, Inc.) $290.

Brother Select-o-matic, No. 90 (Brother International Corp.) $299.50 for portable; consoles, $70 to $90 additional. Made in Japan.

Manual zigzag machines

The following four machines are rated *A. Recommended* as machines for straight stitching and simple zigzag stitching (and hence darning) only. For stitching patterns and designs and thus for all-around zigzag stitching, they would be rated *B. Intermediate.* All but one were full zigzag machines.

Bell 301 (Bell Portable Sewing Machine Corp.) $200.

Bell DeLuxe, Model 402 (Bell Portable Sewing Machine Corp.) $260.

Free-Westinghouse 70 (Free Sewing Machine Co.) $170.

Morse MZZ (Morse Sewing Machine & Supply Corp.) $249. Made in Japan. A semi-zigzag machine.

C. NOT RECOMMENDED

Pfaff Dial-A-Stitch 230. $280. Motor failed to pass test for electrical safety.

▶ **REF:** BULLETIN, July '58, "Buying a zigzag sewing machine"; Nov. '55, "Zigzag Sewing Machines," reprint available; Sept. '52, "Sewing Machines" (straight sewing), reprint available.

- Sewing Machines—cleaning and adjusting, Farmers' Bulletin, 1944, 15c from Superintendent of Documents, Washington 25, D. C.

Straight-sewing machines

A. RECOMMENDED

Anker FA and Model RR (Made in Germany; Anker Corp. of America) A free-arm head.

Bernina, Model 121 (Made in Switzerland; Bernina Sewing Machine Co.)

Borletti, Model BCD-1002 (Made in Italy; Great Eastern Equip. Corp.)

Elna Transforma (Necchi Sewing Machine Sales Corp.) A free-arm head.

Free-Westinghouse ALC Custom (Free Sewing Machine Co.)

National Rotary, Model N50-1190 (National Sewing Machine Co.) A free-arm head.

New Home AHC Standard (Free Sewing Machine Co.)

Sew-Gem, Model 215 (Gellman Mfg. Co., Rock Island, Ill.)

Sewmor, Model 404 (Made in Japan; Consolidated Sewing Machine & Supply Co., Inc.)

Singer, No. 201-2, 221-1, and Slant-Needle, No. 301A (Singer Sewing Machine Co.)

White 77 (White Sewing Machine Corp.)

B. INTERMEDIATE

Coronado Prudence, Model 45-4501 (Gamble-Skogmo, Inc., 15 N. 8, Minneapolis 3)

National R40 (National Sewing Machine Co.)

New Home LLC Challenger (Free Sewing Machine Co.)

White 43 (White Sewing Machine Corp.)

C. NOT RECOMMENDED

The following machines failed to pass a proof-voltage test for electrical safety.

Domestic, Model 151; Necchi BF Mira; Wanamaker National, Model A.

TOY SEWING MACHINES

Toy sewing machines make a chain stitch, a stitch made entirely with a single thread feeding from the spool on the top of the machine. All of the toy machines CR studied were hand operated by a handle or crank on a flywheel. When buying a toy sewing machine, check to see that it actually sews. Be sure also that the moving parts, particularly the needle, are protected adequately to prevent injury to the child's fingers.

Ratings are cr56.

A. RECOMMENDED

Pfaff Princess (American Pfaff Co., 373 Fifth Ave., New York 16) $14.95, including carrying case.

Singer Sewhandy, Model 20 (The Singer Sewing Machine Co., 396 Fifth Ave., N.Y.C.) $12.95. Carrying case available at an additional charge of $4.50.

C. NOT RECOMMENDED

KayanEE SewMaster; Necchi Supernova.

SMALL HAND-SEWING MACHINE

C. NOT RECOMMENDED

Dexter. Usefulness limited; tiring to operate.

Office and writing supplies

Portable typewriters • dictation equipment

contact copying machines • fountain pens

PORTABLE TYPEWRITERS

There are now available several foreign-made portable typewriters in addition to those made in America. At least two of the foreign-made machines are sold under American brand names, the *Royal Royalite* and the *Remington Travel-Riter.* (The other *Royal* and *Remington* models are American-made.) The choice of a model is to some extent a matter of personal needs and taste; it is unlikely that any user will find in any single machine *all* of the characteristics he would like. The buyer is strongly advised that he should in part determine his selection of a machine by an actual, not-too-brief trial.

All machines are available in two standard types, Pica (10 characters per inch) and Elite (12 characters per inch), at no difference in price.

Four of the 14 typewriters tested, the *Groma Kolibri, Hermes Rocket, Royal Royalite,* and *Smith-Corona Skyriter,* were substantially smaller and lighter than the other ten. These four small, light machines are rated separately.

Prices as shown in the listings are without federal excise tax (which is 10 percent of the wholesale price or about 6 percent of the retail list price). The consumer who is willing to shop around can often buy a portable typewriter at a price substantially below list.

Ratings are cr56.

The larger portables

A. RECOMMENDED

Erika 10 (Made in East Germany) $117.50. Weight with case, 18 lb. 6 oz. Frame rigidity, above average. Moderately noisy. Case: wood with cloth covering, fairly sturdy. 3

Everest Jolson (Made in Italy) $117.50. Weight with case, 18 lb. 2 oz. Frame rigidity, above average. Moderately noisy. Case: wood with leatherette covering, fairly sturdy. 3

Olympia De Luxe SM3 (Distributed by Inter-Continental Trading Corp., 90 West St., N. Y. C.; made in West Germany) $117.50. Weight with case, 20 lb. 12 oz. Frame rigidity, above average. Moderately noisy. Case: molded fiber material with painted finish, very sturdy. 3

Remington Quiet-Riter (Remington Rand Div., Sperry Rand Corp., 315 Fourth Ave., New York 10; made in U.S.A.) $115. Weight with case, 20 lb. 14 oz. Frame rigidity, about average. Moderately noisy. Case: wood, cloth covered, with vinyl binding on edges, very sturdy. 3

Royal Quiet De Luxe (Royal Typewriter Co., Div. Royal McBee Corp., 2 Park Ave., New York 16; made in U.S.A.) $122.50. Weight with case, 15 lb. 11 oz. (second lightest of the group). Frame rigidity, about average. One of two quietest in the test. Case: *Fiberglas,* cloth covered, fairly sturdy. 3

* * *

Optima Elite 3 (Made in East Germany) $94.50. Weight with case, 18 lb. 12 oz. Tops of capital letters sometimes failed to print clearly. Frame rigidity, above average. Moderately noisy. Case: wood with imitation leather covering, sturdy. 2

B. INTERMEDIATE

Remington Travel-Riter (Remington Rand Div., Sperry Rand Corp.; made in Holland) $79.95. Weight with case, 15 lb. 6 oz. (lightest of the group). Frame rigidity, below average. Judged to be noisy in operation. Case: wood with fabric covering, sturdy. 2

Smith-Corona Silent-Super (Smith-Corona, Inc., Syracuse) $121.50. Weight with case, 17 lb. 12 oz. Frame rigidity, below average. Machine vibrated noticeably in use. One of two quietest in test. Case: aluminum covered with imitation leather, fairly sturdy. 3

C. NOT RECOMMENDED

Underwood Leader (Underwood Corp., 1 Park Ave., New York 16) $72.50. Weight with case, 17 lb. 11 oz. Frame rigidity, below average. Judged to be noisiest of those tested. Construction considered poor. Case: wood covered with imitation leather, fairly sturdy. 1

Underwood Deluxe Quiet Tab (Underwood Corp.; made in U.S.A.) $119.50. Weight with case, 19 lb. 2 oz. Frame rigidity, below average. Moderately noisy. Alignment of capital letters was poor unless care was used in exerting a uniform pressure in operating the shift key. With this fault corrected, this machine might warrant an *A* rating. Case: wood covered with cloth and imitation leather, fairly sturdy. 3

Extra-small portables

A. RECOMMENDED

Groma Kolibri (Made in East Germany) $109.50. Weight with case, 11 lb. 11 oz. Frame rigidity, above average. Judged to be noisy. Case: reinforced imitation leather. 3

B. INTERMEDIATE

Hermes Rocket (Distributed by Paillard Products, Inc., 100 Sixth Ave., New York 13; made in Switzerland) $69.50. Weight with case, 7 lb. 14 oz. (lightest machine tested). Frame rigidity, above average. Moderately noisy. Bottom of case is a part of the machine; separate sturdy metal cover. 1

* * *

The following two are considered not as desirable as the *Hermes.*

Royal Royalite (Royal Typewriter Co., Div. Royal McBee Corp.; made in Holland) $69.95. Weight with case, 10 lb. 11 oz. Frame rigidity, about average. Moderately noisy. Case: reinforced imitation leather, judged durable. 1

Smith-Corona Skyriter, Model 2-Y (Smith-Corona, Inc.; made in U.S.A.) $69.50. Weight with case, 9 lb. 9 oz. (second lightest of all the machines tested). Frame rigidity, below average. Moderately noisy. Bottom of case is a part of the machine; separate sturdy metal cover. 1

▶ **REF:** Bulletin, Nov. '56.+++

DICTATION EQUIPMENT

Dictation equipment of two general kinds is available: (1) a single unit containing dictating and transcribing facilities; (2) separate dictating and transcribing units. When there would be no great inconvenience in using the same unit for dictation and transcription, or when it is necessary to minimize the outlay, a combination machine, at about $400, would perhaps be the right choice. Two separate machines will involve a considerably greater investment — a total of around $700—but they offer more flexible service. With the use of separate machines, a secretary in the busy office can transcribe material previously dictated while the executive is dictating new material.

The prospective purchaser should, before buying, make sure of the availability of prompt and competent repair service. Most original warranties provide 1-year replacement of all parts and 3-months' service at no extra cost. If the contract is not unduly expensive and the machine purchased is to have hard use, it may be worth while to contract for regular service.

Ratings are cr56.

A. RECOMMENDED

Dictaphone Time-Master (Dictaphone Corp., 420 Lexington Ave., New York 17) Dictating machine, *Model TA-5,* $360, 65 watts; transcribing machine, *Model TB-5,* $360, 45 watts. 105-125 volts, 60 cycles a.c. Recording medium, plastic belt, giving 15 min. of recording time. The *transcribing machine* is similar to the dictating machine, but has a volume control, a tone control, and a speed control.

Edison Voicewriter Combination, Model VPC-1 (Thomas A. Edison, Inc., Edison Voicewriter Division, West Orange, N.J.) $428. 105-125 volts, 60 cycles a.c., 25 watts. Recording medium, 7-in. plastic disk, gives total of 30 min. of dictation. A separate transcribing machine, *Model VPS-1,* at $360, is very much like combination machine, but has speed control in addition to volume and tone control.

Gray Audograph (The Gray Mfg. Co., 16 Arbor, Hartford 1, Conn.) Dictating machine, *Model BID-5,* $361; transcribing machine, *Model BIT-5V,* $363. 115 volts, 60 cycles a.c., 60 watts each. Slight amount of record-surface noise. Recording medium, plastic disks, which provide 10, 15, or 30 min. of recording time per side. The *transcribing machine* had a volume control, a tone control, and a speed control.

Gray Combination, Model BID-5 (The Gray Mfg. Co.) $424. The combination is the *Model BID* dictating machine, with a backspacing attachment which permits it to be used also as a transcriber.

SoundScriber (SoundScriber Corp., New Haven 4, Conn.) Dictating machine, *Model 56R,* $375; transcribing machine, *Model 56T,* $332. 110 volts, 60 cycles a.c., 60 watts each. Recording medium, plastic disks, which provide 4, 7½, and 15 min. of recording time per side. On the *transcribing machine,* there was some tendency for the stylus to ride between the grooves on backspacing, causing "double talk" or echo effect.

* * *

Peirce President Combination, Model 560-D (Peirce Wire Recorder Corp., 5900 N. Northwest Highway, Chicago 31) $419. 115 volts, 60 cycles a.c., 52 watts. Recording medium (magnetic belt) can be erased and re-used indefinitely. Provides 15 min. of recording time. Used as a transcriber, the machine had a volume control, but no speed or tone controls.

B. INTERMEDIATE

Comptometer Commander Combination, Model D20A (Felt & Tarrant Mfg. Co., Comptometer Dictating Machine Division, Algonquin, Ill.) $440. 115 volts, 60 cycles a.c., 75 watts. Recording medium, plastic belt which holds 11 min. of dictation. Same machine used as a transcriber. Leakage current, excessive, otherwise would be *A. Recommended.* ¶Newer model, *D20AG,* at same price, has negligible leakage and is *A. Recommended.*

Stenorette (DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N. Y.; manufactured in Western Germany by Grundig) $170 with accessories for use as either a dictating or a transcribing machine. Available as combination machine, with accessories, at

$27.75 extra. 110 volts a.c. only, 28 watts. Recording medium, magnetic tape, which provides 30 min. of recording time.

Portable machine

A. RECOMMENDED

SoundScriber 200 (SoundScriber Corp., New Haven 9, Conn.) $275. 115 volts a.c., 20 watts. Recording time, 15 min. on same type of disks used on larger *SoundScriber* machines. The *SoundScriber 200's* chief advantages are small size and light weight. The complete unit, weighing 6 lb. and measuring 3 x 7 x 10⅜ in., can be carried conveniently.

▶ **REF:** BULLETIN, Mar. '56+++, Apr. '56+++, Dec. '56+++.

CONTACT COPYING MACHINES

The four common copying processes are: diazo, thermal (using heat), dye-transfer, and silver-transfer.

In either the diazo or the thermal procedure, the originally exposed sensitive paper itself becomes the final copy. Diazo prints, which must be made from translucent originals, require chemical development by exposure to ammonia gas or to a liquid developer. The thermal print requires no further treatment after exposure.

Both the dye-transfer and silver-transfer processes involve negatives which are developed in liquid baths. Positive copies are obtained by squeezing a positive paper into close contact with a damp negative, allowing it to remain a brief period while the image "transfers"; the papers are then stripped apart. A dye-transfer negative can be re-used a number of times to obtain additional positive copies. As a rule, the silver-transfer process permits obtaining only one copy from each negative, although some manufacturers claim three or more copies can be made. Special papers, special developers, especially low surrounding illumination, and special operator skills are needed, however, to obtain multiple copies by the silver-transfer process.

With a roller-type printer, the original document and the sensitive paper are carried past a source of light (or radiant heat). Only thin and flexible original material can be used. For copying pages in magazines or books or other thick or non-flexible originals, a device called a flat-bed printer is needed. For all-around use involving copying of a variety of original material, including pages in books and magazines, the dye-transfer process (e.g., *Verifax*) is probably best. If single sheets only need to be copied, and it is possible to avoid the use of certain inks and pencils that do not reproduce by the thermal process, then the *Thermo-Fax Secretary* is a good choice, because of its speed and simplicity and cheapness of operation. Remember, however, that the copies must be protected from excess heat to remain usable.

For users of many copies who generally prepare for themselves the original material to be copied—as architects, engineers and the like—the diazo process may be best because of low cost per copy, despite its limitation that originals must be on translucent material and on one side of the paper only. For copies of the highest contrast and best over-all quality, select the silver-transfer process, keeping in mind, however, that this method is the highest in cost per copy and involves more handling of developing solutions than any of the others.

The tests made by Consumers' Research were not extensive enough on all brands considered to justify rating them as *A. Recommended, B. Intermediate,* and *C. Not Recommended.* (CR has not tested any of the machines for electrical safety. See the section on "Safety in the home," pages 94-96, for general information about electrical hazards and advice about grounding of certain appliances.)

After each manufacturer's name in the list below, prices are given for the lowest price units available of the following sorts: CPD, R—combination printer and developer in single machine, roller-feed printer; CPD, FB—combination printer and developer in single machine, flat-bed printer; FBP—separate flat-bed printer; PFBP—portable flat-bed printer (including case, if separately available); D—separate developer. Only the lowest price for each type listed is given; size and other details must be known to compare values. The initial cost of obtaining and putting into use any of these machines will include some extras (which can easily run to $100 or more). Before you decide to buy, have the salesman write out the proposed order, *including all accessories and supplies.* Then take a good look at the *total* price.

Diazo process

Copyflex (Charles Bruning Co., Inc., 4700 Montrose Ave., Chicago 41) CPD, R $555 (fluid developing).

Ozalid (Ozalid Division of General Aniline & Film Corp., Johnson City, N.Y.) CPD, R $410 (vapor developing).

Pelprinter (Pelprinter, Inc., 555 Central Ave., Orange, N.J.) Portable printer (7 lb.) and vapor developer, hand-operated, relatively inconvenient, but serviceable for some purposes, $70.

Thermal process

Thermo-Fax (Minnesota Mining & Mfg. Co., St.

Paul 6) Roller-feed printer (no developer required; see text), $299.

Dye-transfer process

Photostat Instant Copier (Photostat Corp., Rochester 3, N.Y.) CPD, FB $199. Utilizes Eastman Kodak Company's *Verifax* materials.

Verifax (Eastman Kodak Co., Rochester 4, N. Y.) CPD, FB $148 (for the new *Signet* model; others higher).

Silver-transfer process

Apeco Auto-Stat (American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26) CPD, R $395.

Contoura-Constat (F. G. Ludwig, Inc., Old Saybrook, Conn.) PFBP $68. D $87 (hand powered; $29 extra for motor). Flat-bed printer has a translucent plastic, air-inflatable cushion between light source and copy. The cushion, intended to allow the negative paper to be pushed tightly against an open book or other nonflat original, works fairly well. Its presence, however, makes it a little more trouble to get good copies of flat originals.

Copease (Copease Corp., 425 Park Ave., New York 22) CPD, R $295. CPD, FB $299. FBP $108. PFBP $80. D $193.

Copycat (Copycat Corp., 215 Fourth Ave., New York 3) CPD, R $295. FBP $85. PFBP $80. D (hand) $85. D (electric) $160.

Copy-Craft (Copy-Craft, Inc., 105 Chambers St., New York 7) CPD, R $289. CPD, FB $249. FBP $149. PFBP $80. D (hand) $100. D (electric) $200.

Cormac (Cormac Photocopy Corp., 80 Fifth Ave., New York 11) CPD, R $299. FBP $169. D $123.

Dick (A. B. Dick Co., 5700 Touhy Ave., Chicago 31) CPD, FB $350. Combines in one unit a flat-bed printer and roller-feed developer. Printer will handle books and similar material up to about 1⅛ inch, but not thicker.

Dri-Stat (Peerless Photo Products, Inc., Shoreham, N.Y.) CPD, R $195. FBP $131. D $185.

Exact-Fax (General Photo Products Co., Inc., Chatham, N.J.) CPD, R $225. FBP $89. D (hand) $85. D (electric) $150.

Hecco Kwik (Hunter Photo-Copyist, Inc., Syracuse 4) CPD, R $195. FBR $165. PFBP $80. D $185. Similar in appearance to *Dri-Stat* machines.

Nord (Nord Mfg. Co., Mineola, L. I., N. Y.) CPD, FB $179.

Photorapid (Duophoto Corp., 236 Fifth Ave., New York 1) CPD, R $298. CPD, FB $169. FBP $135. PFBP $80. D $190.

Remington Rand (Remington Rand Division of Sperry Rand Corp., 315 Fourth Ave., New York 10) CPD, R $350. PFBP $80. FBP $172.

Rovico Fotomate (Rovico, Inc., 318 Market St., Newark, N.J.) CPD, R $275. FBP $154. PFBP $95. D $195.

▶ **REF:** Bulletin, Mar. '58.+++

POCKET ADDING MACHINES

So-called miniature calculators are widely advertised in mail-order sections of certain magazines and some metropolitan newspapers. Generally, all of them are similar in having columns of numbers or dials which are moved, usually with a sharpened wooden rod, to permit adding or subtracting—as one manufacturer describes it, "with a flick of the finger."

Some of these adding machines are automatic in that the dials are geared together so that when the total of any column becomes equal to or greater than ten, the one is carried over automatically to the next column to the left. Others have no such gearing, making it necessary for the operator to "carry one" to the next column by an extra operation. The devices which do not carry into the next column are of little value for any sort of computing.

There are many of these gadgets offered for sale today, but because of the slowness and awkwardness inherent in their basic design they are unsatisfactory. There is no cheap way to do the job of adding or subtracting mechanically. Pencil and paper offer the cheapest method and will give results much faster than any of the heavily advertised miniature or pocket calculators that do not have carry-over gearing.

Rating is cr56.

B. INTERMEDIATE

Kes-Add Pocket Adder (The Hart Vance Co., St. Louis 3) $1.98. Adds and subtracts numbers to a total of not over four figures in the resulting sum. Has carry-over feature. Claimed to do multiplying and dividing, but not at all well suited for either.

* * *

A not-recommended rating applies to the great majority of low-priced, very small or pocket-sized, so-called economy adding machines which are claimed or implied to give results comparable with regular adding machines.

▶ **REF:** Bulletin, Oct. '49+++, Oct. '56++.

POSTAL SCALES

Nearly all of the many brands of inexpensive postal scales are inaccurate, and some have large errors. Since the error is usually such that the weight appears to be more than it is, the user will put on too much postage, rather than too little. For most users it would be better to waste a stamp or two occasionally than to spend the $15 or more needed to get an accurate scale, which in most homes would be used only infrequently.

The best of the inexpensive scales CR tested was the *Hamilton Model 50,* found to have an error less than one-tenth ounce up to its capacity of 8 ounces. This is much better than the usual small spring postal scales.

Anyone who wishes to make his own simple, accurate postal scale can do so in a short time following directions given in the February 1957 issue of the Bulletin. With care in calibrating, greater accuracy can be obtained than with most of the commercially available inexpensive postal scales.

A. RECOMMENDED

Triner Air Mail Accuracy Scale, No. 9-T (Triner Scale & Mfg. Co., 2714 W. 21, Chicago 8) $15.25. Capacity, 9 oz. by ½ oz. Well-made *beam scale* (best type for the purpose).

Triner Air Mail Accuracy Scale, No. AA-2 (Triner Scale & Mfg. Co.) $30.50. Capacity, 2 lb. by ¼ oz. Well-made *beam scale.*

B. INTERMEDIATE

Hamilton Postal Scales, Model No. 50 (Hamilton Specialties, Inc., 5 Watson St., Boston 18) $3.95. Capacity, 8 oz. by ¼ oz. Pendulum type, with pan. Best by far in the low-priced group.

* * *

Hanson, Model 1546 (Hanson Scale Co., Northbrook, Ill.) $4.95. Capacity, 2 lb. by 1 oz. Spring scale, pan above dial.

Mite (B-T Co., Inc., 121 N. Broadway, Milwaukee 2) $3. Capacity, 16 oz. by 1 oz. Spring scale, pan above dial.

C. NOT RECOMMENDED

Hanson Desk Post Office, Model 1562 (Hanson Scale Co.) $4.95.

Postamatic (Postamatic Co., Philadelphia 41) 49c.

* * *

Other spring scales tested previously and rated *C* were: **Hanson, Model 1509,** $10.95; and **Liberty, No. 1,** $3.40.

▶ **REF:** Bulletin, Feb. '57.+++

FOUNTAIN PENS

Although the use of ball-point pens has been increasing steadily, even the most satisfactory ball pen available will not take the place of a first-rate fountain pen for some purposes. In recent years, manufacturers have introduced fountain pens with new features which differ from the ones with side-lever fillers or plunger or pump filling mechanisms. *Sheaffer's Snorkel* has a thin tube which is moved to extend beyond the writing point for filling, and withdrawn when the pen has been filled (avoiding the need to wipe the pen and pen section after the filling operation). The *Parker "61"* fills by capillary action, without moving parts. There are several new fountain pens that use liquid-ink cartridges, which can be bought separately in the same way as ball-pen refills. The only significant advantage of the cartridge-filled fountain pen is that two or three refills can be easily carried in one's pocket, bag, or suitcase — a convenience for travelers. Ink in cartridges is very expensive, relatively; it is doubtful that many, except travelers, would find the extra convenience worth the additional cost of having ink supplied in small cartridges. A cartridge can be partially refilled from an ink bottle if regular refills are not readily available.

Features one should look for in buying a fountain pen: smoothly finished point; free flow of ink; large ink capacity; a cap that stays securely on the butt end when the pen is in use.

It is important to use a pen having a free flow of ink for writing checks or important papers, and the ink should not be of the "washable" type and should be of a kind that will turn to an intense blue-black in time. (See "The Writing of Checks," in the October 1953 Bulletin.)

The pens in the listings had side-lever fillers, except as follows: the *Koh-i-Noor Rapidograph* and *Sheaffer's Cadet, Craftsman,* and *Snorkel* had plunger or pump-filling mechanisms; the *Parker "21"* and *"51"* pens had squeeze-type filling mechanisms; the *Parker "61"* "fills itself" by capillary action; *Esterbrook, Sheaffer's, Waterman's,* and *Wearever* cartridge pens use liquid-ink cartridges. Writing points were of the usual type unless otherwise noted. A dagger (†) following the brand name indicates that the writing point was of gold or equivalent precious metal alloy; others were of stainless-steel type of alloy. Prices include federal tax where applicable.

A. RECOMMENDED

Esterbrook. $2.95 and $3.50, depending upon point series selected. Wide selection of point replacement units, 60c and $1.15. 1

Esterbrook De Luxe. $5.20 and $5.75. 2

Esterbrook Safari Twin Cartridge Pen. $3.95, with 2 ink cartridges. Refills, 6 for 39c. Liquid ink is supplied by two cartridges (one of which is a spare) inserted in the barrel of the pen. Ink cartridge is too small; one larger cartridge, instead of two small ones, would be more convenient. 2

Parker "21" Special. $5. Hooded point. 2

Sheaffer's Craftsman. $5. 2

Waterman's C/F (Cartridge-Filled). $5.95, with 1
ink cartridge. See listing of *Waterman's C/F*† pens. 2

Parker "51" Deluxe.† $12.50. Hooded point. Finely finished. 3

Parker "61" Standard.† $20. Hooded point. Finely finished. Pen has no moving parts and "fills itself by itself" (very slowly) from the end opposite the point, by capillary action. Ink capacity, low. Not found to be more convenient or to take less time to fill than a pen with a lever-filling mechanism. 3

Sheaffer's Admiral Snorkel.† $10. In filling, a thin tube is moved to extend beyond the writing point, and is withdrawn when pen has been filled. Ink capacity, low. ¶*Statesman Snorkel.*† $15.50. Tapered point; otherwise similar to the *Admiral Snorkel.* 3

Waterman's C/F (Cartridge-Filled).† $8.75, $12.50, $16.50, with 8 ink cartridges. Refills, 8 for 50c. Tapered point. Liquid ink is supplied by a cartridge inserted in the pen point section. 3

* * *

Koh-i-Noor Rapidograph. $4.50. A special-purpose pen designed for use with black carbon ("India") ink used by draftsmen and artists. Will work with regular ink also, but not as well. A small metal tube forms the writing point. 2

B. INTERMEDIATE

Sheaffer's. $2.25. 1

Sheaffer's Cartridge Pen. $2.95, with 2 ink cartridges. Refills, 5 for 49c. Liquid ink is supplied by a cartridge inserted in the barrel of the pen. Would warrant an *A* rating except for difficulty (considerable pressure required on two samples) in penetrating the cartridge-end. 1

Venus. $1. Replaceable points, 4 styles, 35c each. 1

Sheaffer's Cadet. $3.75. 2

* * *

Deemed less desirable:

Wearever Ink Cartridge Pen. $1.49, with 6 ink cartridges. Refills, 6 for 49c. Liquid ink is supplied by cartridge inserted in the barrel of the pen. 1

Wearever Pennant. $1. 1

BALL-POINT PENS

Perhaps the chief advantage of a ball pen is that it will usually start to write on contact with a writing surface even if unused for a considerable period (a fountain pen often will not, and in a month or two will dry up completely). A ball-point, too, will make good carbon copies. The retractable (push-button) ball pens are far more convenient to use than the kind requiring a cap, and reduce the likelihood of fingers and clothing being smeared by the ink. Fine ball points are less likely to give trouble with smearing of the point and "blobs" of ink in the writing—often characteristic of the medium and broad ball points. Ball-pen ink stains can usually be removed readily from the fingers with ordinary rubbing alcohol. Rubbing alcohol may be used for removing ball-pen ink from some fabrics; however, removal of the ink from clothing is often difficult, and may defy even the skill of the professional dry cleaner.

While the first ball-pen inks faded badly after a short period of exposure to light, nowadays most have fairly good to good resistance to fading. A ball point lacks flexibility, and hence does not shade the writing; absence of this shading impairs greatly the characteristic qualities of a person's handwriting and makes forging a signature relatively easy. It is therefore wise to avoid writing or signing checks and legal papers with ball pens.

A report on recent tests of ball-point pens, including brands now sold with cartridges that have large ink capacity, is scheduled to appear in the September 1958 Bulletin. Brief listings follow.

A. RECOMMENDED

Esterbrook. $2.50; refill, 69c.

Ferber "49'er." 49c; refill, 25c.

Flo-Ball "Automatic," No. 210. $2; refill, 50c.

Parker Special T-Ball Jotter. $1.95; refill, 79c.

Scripto Satellite. $1.95; refill, 69c.

Sheaffer's Skripriter. $2.95; refill, 89c.

Venus "Longer Performance." $1; refill, 49c.

Waterman's La Plume. 98c; refill, 50c.

Waterman's Sapphire. *"Astralite"* model (chrome finish), $2.50; *"Golden"* model, $4.95; refill, 89c.

Wearever Marlboro. $1; refill, 49c.

B. INTERMEDIATE

Autopoint 3X. 49c. Non-refillable.

Eversharp "Small Ball." $1.95; refill, 50c.

Koh-I-Ball. *No. 3020,* fine point: 39c (with point protector and clip, 45c); refill, 25c. *No. 3021,* medium point: 29c; refill, 15c. Looks like an ordinary wooden pencil and is offered for sale as a "ball-point pencil," but has cartridge with the usual colored ball-pen ink.

Paper-Mate Tu-Tone. $1.69; "Standard" refill, 49c. *Piggy-Back* refill, 69c.

Scripto Super Dollar. $1; refill, 49c.

Scripto T400. 29c; refills, 2 for 29c.

Wearever Miracle. 50c; refill, 25c.

INKS

A superior fountain pen ink is one that, while it writes blue, will darken nearly to black with time. An example of a good ink of this general type is *Waterman's Blue Black Permanent.*

When filling a pen, be sure to keep the point in the ink an additional two or three seconds after filling seems to be completed, and wipe off the excess ink from the point.

▶ **REF:** Bulletin, Jan. '52.++

Housewares

Dinnerware • table flatware • knife sharpeners • salad makers
ice crushers • can openers • cooking utensils • meat thermometers

DINNERWARE

China is the best known dinnerware. It is strong and more resistant to chipping, cracking, and crazing than earthenware, which is by far the most common kind, and it will not mark and scratch like plasticware. The basic and important difference between chinaware and earthenware is that china is translucent and non-absorbent.

Earthenware, sometimes called semi-porcelain or semi-vitreous ware, besides being relatively soft and porous, is thicker and heavier than china. Decorations are applied to earthenware either before the ware is glazed, called underglaze decorations, or after the glaze has been fired, called overglaze decorations. Gold decorations are always applied over the glaze. Underglaze decorations will likely last as long as the dishes; overglaze decorations will last a long time if reasonable care is given in dishwashing.

An "open stock" pattern of dinnerware is one from which a customer may purchase any number of dishes in a pattern, ranging from a single item to a complete set. It is *not* guaranteed, as some suppose, that such a pattern will be available indefinitely. An open stock set nowadays lasts anywhere from six months to two years, with only a few manufacturers offering open stock patterns for as long as 20 years.

Plastic dishes

Plastic tableware is not broken as easily as china and is less noisy to handle. It has some disadvantages, however, since the surfaces are relatively soft and may be easily marred by knife scratches, or simply by stacking the dishes one on top of the other.

Cups made of melamine plastic also commonly become stained from coffee and tea, especially after the smooth original surface is lost. Products especially formulated for bleaching stained cups are available. In tests by Consumers' Research, three brands of cups made of other plastic materials were not stained by coffee. Melamine dishes, however, generally proved to be more satisfactory than other kinds, since in the tests they were least scratched and marked by use. Different brands made from melamine were essentially indistinguishable one from the other in this respect. All melamine dishes, furthermore, were satisfactory when washed in automatic dishwashers, provided that no part of any dish was allowed to come very close to the heating coil. Several brands not made of melamine softened so readily when heated that it would not be advisable to wash them in an automatic dishwasher having a heating element (not all dishwashers have one), and the *Gothamware* dishes tested probably should not be washed in an automatic dishwasher at all.

A. RECOMMENDED

Harmony House "Catalina" (Sears-Roebuck's Cat. No. 21—3505) $9.96, plus postage, for 16-piece starter set. 2

Harmony House "Today" (Sears-Roebuck's Cat. No. 21—3510) $7.47, plus postage, for 16-piece starter set. 2

Boontonware "Belle" (Boonton Molding Co., Boonton, N.J.) $4.75 for 5-piece place setting consisting of one 10-in. and one 6⅜-in. plate, bowl, cup, and saucer; $14.95 for 16-piece starter set. 3

Brookpark "Desert Flower" (International Molded Plastics, Inc., Cleveland 9) $6.25 for 5-piece place setting. 3

Color-Flyte (The Branchell Co. [now Lenox Plastics, Inc.], St. Louis 16) $6.50 for 5-piece place setting. Line is being discontinued. 3

Holiday "Texture" (Kenro Corp., Fredonia, Wis.) $6.15 for 5-piece place setting. 3

Lifetime Ware (Watertown Mfg. Co., Watertown, Conn.) $5.40 for 5-piece place setting. 3

Russel Wright "Residential" (Northern Industrial Chemical Co., South Boston 27) $6.95 for 5-piece place setting. 3

Texas-Ware "Bouquet" (Plastics Mfg. Co., Dallas 10) $8.45 for 5-piece place setting. 3

Texas-Ware "Nassau" (Plastics Mfg. Co.) $7.15 for 5-piece place setting. 3

B. INTERMEDIATE

Mallo-Ware (Mallo-Ware Corp., Chicago 44) $5, list price, for 5-piece place setting. 2

Newport (Bryant Electric Co., Hemco Plastics Division, Bridgeport 2, Conn., a subsidiary of Westinghouse Electric Corp.) $3.20 for 5-piece place setting. Cup handles had sharp-edged holes too small for fingers. Except for cups, would warrant an *A-Recommended* rating. 2

Texas-Ware "El Capitan" (Plastics Mfg. Co.) $3.90 for 5-piece place setting. Thinnest *Melamine* brand tested; had lowest impact resistance. 2

Florence (Prolon Plastics Div., Pro-phy-lac-tic Brush Co., Florence, Mass.) $5.70 for 5-piece place setting; $14.95 for 16-piece starter set. 3

C. NOT RECOMMENDED

Gothamware (Gotham Industries, Inc., New York 1) $3.95 for No. 23 Dinner Set consisting of 23 pieces. Judged not suited for table use but, in view of their low cost, might be purchased for use on picnics or for similar purposes. Flammable. 1

Hemcoware (Bryant Electric Co.) $1.43 for 5-piece place setting. Except for flammability of cups, would warrant a *B-Intermediate* rating. 1

Tranquil (Byrd Plastics, Inc., Erie, Pa.) $2.70 for 5-piece place setting; $9.95 for 20-piece starter set; $7.95 for 16-piece set. Flammable. 2

▶ **REF:** Bulletin, Sept. '57.+++

TABLE FLATWARE

Silver plate is made of a base metal or base metal alloy plated with a coating of pure silver. There are six grades of plated silver commonly sold to consumers, from the so-called A1, the thinnest plate, to XXXX or quadruple plate.

Standard or grade	Number of ounces of pure silver per gross of teaspoons
"A1" or "Standard"	2
"A1+" or "A1X" or "Extra"	2½*
"AA"	3
"Double" or "XX"	4
"Triple" or "XXX"	6
"Quadruple" or "XXXX"	8

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* Or 2 ounces plus overplate at points of greatest wear.

Some silver table knives may have their blades held in hollow handles by cement; such knives should not be washed in an electric dishwasher, as the high temperatures in the machine would likely melt the cement. Most manufacturers today join handles to knife blades by means which are not affected by the heat of the dishwasher; check the manufacturer's instructions. Knives made of the gold-colored alloy known as *Dirilyte* are made in one piece, but the manufacturer does not recommend washing *Dirilyte* tableware in a dishwasher.

Sterling silver is an alloy containing 925 parts of silver and 75 parts of copper added for strength. By government regulation, silverware must not be stamped "sterling" or "sterling silver" unless it meets these requirements. The differences in flatware made of sterling silver are in weight, design, and workmanship—the sort of things which the consumer can observe and judge and compare fairly well for himself.

STAINLESS-STEEL FLATWARE

Stainless-steel table flatware is sold at a surprisingly wide range of prices, from about 85 cents to more than $15 for a five-piece setting. Inexpensive stainless flatware is usually stamped out, and since each piece has the same thickness at all points, it may be awkward to hold and use. Better and more expensive kinds are tapered toward the ends of the handles, the edges of the spoon bowls, and the ends of fork tines, just as good silverware is, and therefore the pieces have a more pleasing feel and appearance.

Some stainless-steel flatware made in Japan shortly after the war rusted after a few months' use, as the result of the lowered chromium content of Japanese stainless steel. Later Japanese steels are said to be improved.

Basically there are four finishes for stainless-steel flatware. Two are "reflective" finishes, one brighter than the other. Two are relatively dull finishes: one a so-called satin finish and the other a dull finish without gloss.

All brands CR tested resisted staining by various foods quite satisfactorily, but mustard stained all but three knife blades in 16 hours of contact. Two inexpensive brands distributed by Sears and Montgomery Ward had poor resistance to scratching as well as other deficiencies. Neither of these two brands is listed in current catalogs.

A. RECOMMENDED

Ekco Lady Juliana (Ekco Products Co., 1949 N. Cicero Ave., Chicago 39) $9.50 for 5-piece set.

Georg Jensen (Made in Denmark; Georg Jensen, Inc., 667 Fifth Ave., N.Y.C.) $12 to $20 for 6-piece sets.

Simplicity (Sears-Roebuck's Cat. No. 4-49080) $14.97, plus postage, for 24-piece set.

B. INTERMEDIATE

Flint Lincoln (Ekco Products Co.) $5.75 for 5-piece set.

Insico Masterpiece (International Silver Co., Meriden, Conn.) $2.87 for 5-piece set.

Insico Ravenna (International Silver Co.) $3.47 for 5-piece set.

International New Dawn (International Silver Co.) $5.92 for 5-piece set.

International World Chieftain (International Silver Co.) $5.98 for 24-piece set.

Lady Dunlap (Sears-Roebuck's Cat. No. 4-49110) $7.44, plus postage, for 24-piece set.

Oneida Deluxe Accent (Oneida Ltd. Silversmiths, Oneida, N.Y.) $4.75 for 6-piece set.

Oneida Parade (Oneida Ltd. Silversmiths) $8.95 for 24-piece set.

Providence (Sears-Roebuck's Cat. No. 4-49650) $9.60, plus postage, for 24-piece set.

Silco Liberty (International Silver Co.) $1.52 for 5-piece set.

Stegor Pace (Black, Starr & Gorham, 594 Fifth Ave., New York 36) $7.50 for 5-piece set.

Wallace Custom Sonnet (R. Wallace & Sons Mfg. Co., Wallingford, Conn.) $6.54 for 5-piece set.

Wallace Hallmark Ainsley (R. Wallace & Sons Mfg. Co.) $3.89 for 5-piece set.

Wallace Silverskill Poise (R. Wallace & Sons Mfg. Co.) $4.95 for 5-piece set.

Wm. A. Rogers Northland (Oneida Ltd. Silversmiths) $6 for 5-piece set.

▶ **REF:** Bulletin, Dec. '55.

KNIFE SHARPENERS

A good home craftsman can do a very satisfactory job of sharpening a knife by use of a coarse oil stone or carborundum stone and then a fine steel. A grinding wheel is needed to produce a new cutting edge on cutlery with soft-steel blades or good hard-steel blades that have become nicked. Grinding, however, unless done with care and patience, produces a poorly shaped edge and makes it more difficult to secure a sharp edge of the proper type next time.

Electrically-powered sharpeners of the kind having a motor-driven abrasive wheel are expensive, but for fine cutlery a good electric-powered sharpener is to be preferred over other kinds. These sharpeners are designed to hold the blades at the correct angle to the honing wheel, produce satisfactory edges, and are easy and safe to use.

Scraper-type sharpeners and hand-operated abrasive wheels are not suitable for really fine knives but will serve for sharpening less expensive knives.

Electric-powered

B. INTERMEDIATE

Cory, Model DKS-2 (Cory Corp., 3200 W. Peterson Ave., Chicago 45) $14.95 3

Oster Electric Knife Sharpener, Model 500 (John Oster Mfg. Co., Milwaukee 17) $16.95. 3

* * *

Handy-Hannah, Electric Knife Sharpener, No. 7950 (Standard Products Corp., Whitman, Mass.) $7.95. 3

Hand-operated abrasive wheels

B. INTERMEDIATE

Dazey Sharpit, Model 900 (Dazey Corp., Warne and Carter Ave., St. Louis 7) $4.

C. NOT RECOMMENDED

Rolit Knife Grinder • Holco, "Household" Model • Hone-Rite, Standard Model • Swing-A-Way Edgemaster, Model 519.

Disk scraper type

B. INTERMEDIATE

Ace (Ace Products Co., Chalfont, Bucks Co., Pa.) $1.25. Screw-mounted.

Eversharp (The Voos Co., 161-165 Porter, New Haven, Conn.) 39c.

C. NOT RECOMMENDED

Ace (Ace Products Co.) $1.50. Hand-held.

Other scraper types

B. INTERMEDIATE

Aladdin, No. 112 (New England Carbide Tool Co., Inc., 60 Brookline, Cambridge 39, Mass.) $2.

Easi-Sharp (H. R. Ransom & Co., 8689 Grand River, Detroit 4) 25c.

C. NOT RECOMMENDED

Superedge. $1.

▶ **REF:** Bulletin, Mar. '52.

SALAD MAKERS

Salad makers have cones or disks with projections that grate, shred, string, or slice vegetables, fruits, and nuts. Don't expect to use a salad maker so easily or deftly as the demonstrator does, especially at first. Some experience is required, as well as familiarity with the directions for handling and cutting the foods to be processed.

A. RECOMMENDED

Mouli-Julienne (Mouli Mfg. Corp., 91 Broadway, Jersey City, N. J.; Montgomery Ward's Cat. No. 86—

5112) $4.69, plus postage. Sold with five disks for slicing, chopping, and medium, fine, and superfine shredding. Had a "pusher" to bring the food into contact with the cutting disks (desirable for safety of user's fingers).

B. INTERMEDIATE

Rival Kitcheneer, No. 377 (Rival Mfg. Co., Kansas City 29) $18.95. A combination meat grinder and salad maker. Had meat-grinding hopper with 3 cutting disks and a salad maker with 3 cones for grating, shredding, and slicing. Accessory cones for waffling and extra-thin slicing disk also available. Would be rated *A* if pusher provided.

Royal Supreme (Manufacturer's name not given; imported from Solingen, Germany) $5.95. Sold with 4 cones for shredding, slicing, grating, and "superfine" grating.

C. NOT RECOMMENDED

Magic Hostess Shredder, No. 556 (Magic Hostess Corp., Kansas City 29; Montgomery Ward's Cat. No. 86—1115) $10.89, plus postage. A combination meat grinder and salad maker. Meat-grinding hopper and a salad-maker hopper with 3 disks for shredding, grating, and slicing.

▶ **REF:** BULLETIN, Dec. '56.

ICE CRUSHERS

Wall-type ice crushers sell at $8 and up. The separate electric ice-crushing appliances sell at about $30. Attachments for other motor-driven appliances sell at about $13 up.

Ratings are cr57.

A. RECOMMENDED

Dazey 160 (The Dazey Corp., St. Louis 7) $10 up. A wall-mounted grinder with an adjustment to provide fine, medium, or course crushed ice.

Ice-Jet attachment of the Waring Blendor (Waring Products Corp., New York 37) $17 for attachment only (*Blendor*, $45). Grinds four trays of ice cubes in a minute and a half.

B. INTERMEDIATE

Tap-Icer (Tap-Icer Co., 375 W. Third St., Williamsport, Pa.) $1 each; 3 for $2.75. A hand-held device. Essentially a convex aluminum disk about 1½ in. in diameter fastened to a spring-steel grip.

CAN OPENERS

For some time consumers were able to have some assurance of the quality of can openers by buying those that carried labels or tags indicating approval by the Can Manufacturers Institute. This Institute set up a testing program in 1952 by which a manufacturer of can openers submitted a sample of each model he made; to receive approval, the openers were required to meet certain unpublicized performance standards with respect to durability, size of cans they would open, safety, ease of operation, and the number of metal slivers that dropped inside the can. At the end of 1957, the program was discontinued.

Since the requirements of the Can Manufacturers Institute were generally in agreement with qualities which Consumers' Research has considered important, we believe that consumers should select a can opener which has received and shows on an accompanying tag the approval of the CMI, where such openers still remain in stocks of hardware and department stores.

Can openers approved by the CMI as of August 1957 are listed. All are wall-mounted except as noted.

Best 70-69 (hand), and 170 (Best Mfg. Co., New York 19)

Blue Streak 165, and Magnetic 165M (Turner & Seymour Mfg. Co., Torrington, Conn.)

Campbell (Cahil Mfg. Co., New York 19)

Can-O-Mat DL-150, 157, DL-245, and Jr. 150A (Rival Mfg. Co., Kansas City 8, Mo.)

Dazey Budgit-Blade 32, Jr. 33, Hold Tite Magnetic 61, Senior 61, Speedo 64, Klean Kut 68, Table Topper 70C (table), Dual Electric 78C (table), DeLuxe 80, 88, Vacumatic 90, Vacumatic 98, Heavy Duty 508 and 1508 (institutional) (Dazey Corp., St. Louis 7)

Drop-A-Way Blue Streak Magnetic A-349-1 (Turner & Seymour Mfg. Co.)

Edlund 5 (hand), 30 (table), 77, 1 and 2 (institutional) (Edlund Co., Burlington, Vt.)

Flint 889 (hand), 891 (Ekco Products Co., Chicago 39)

Flip-Up 400 (Cahil Mfg. Co.)

Hobart Size 10, Type C (Hobart Mfg. Co., Troy, Ohio)

Magic Hostess 52M, and 5311 (Magic Hostess Corp., Kansas City, Mo.)

Magna-Matic 500 and Jr. 300 (Cahil Mfg. Co.)

Maid of Honor 4014, 4015, 4036, 4046, 4067, 4068 (Distributed by Sears, Roebuck & Co.)

Miracle (hand) (Ekco Products Co.)

Oster (electric) (John Oster Mfg. Co., Milwaukee) An attachment for the *Oster* meat grinder.

Quintuplet 110, and 120 with Magnet (both hand) (Cahil Mfg. Co.)

Rival 140A, 165, 170, 270, and Swing-type 257 (Rival Mfg. Co.)

Super Kan Master 15, 25, and 35 (all institutional) (Turner & Seymour Mfg. Co.)

Swing-A-Way 104, Discutter 175, 307W, 307WM, 314, 507, 607, 907, 1209W, 1409W, 1709W, and 407 (hand) (Swing-A-Way Mfg. Co., St. Louis 16)

Turner & Seymour 57 (hand).

Vaughan's DeLuxe 300, Flex-Roll (hand), Flex-Roll Champion 740, Safety Roll Jr., Utility Safety Roll (hand) (Vaughan Mfg. Co., Chicago 24)

Westco 15 and 66 (hand) (Turner & Seymour Mfg. Co.)

Zim-Matic Z13-M, Zim DeLuxe (Zim Mfg. Co., Chicago)

JAR OPENERS

A. RECOMMENDED

Gilhoolie, Model 2C (The Riswell Co., Cos Cob, Conn.) $2.95. An opener for "any jar, glass or bottle" with "screw-top, twist top, lift-top, pry-off top." Found effective, although some plastic tops were cracked unless care was exercised, and metal tops were marred. cr57

Under-shelf (Smith-Drake Corp., 1206 S. LaBrea Ave., Inglewood, Calif.) $1. An under-shelf opener with ridge for holding jar top against a serrated jaw. This leaves both hands free for turning bottle or jar. cr57

OTHER OPENERS

A. RECOMMENDED

Can-Mate (Slip-Seal Co., 1750 California Ave., Long Beach, Calif.) 25c. Re-usable key-type opener for vacuum-packed cans. cr57

Spouto (Keyes-Davis Co., 74 14 St., Battle Creek, Mich.) $1. Punch-type opener for juice and milk cans. cr57

LID LIFTER

A. RECOMMENDED

Ekco Pry-Off Lid Flipper (Ekco Products Co., 1949 N. Cicero Ave., Chicago 39) 15c. cr55

COOKING UTENSILS

There is no one metal, alloy, or solid ceramic or ceramic-coated material that fulfills all the requirements for what might be called an ideal cooking utensil. For this reason, as well as others, it is best not to buy utensils in sets. The wisest plan is to buy a few good-quality general-use pots and pans first, each of the kind and size best suited for its purpose, adding to that number as the need for other sizes and types becomes evident.

For top-of-the-range cooking, select pans that fit the heating element or burner. Be sure that the handle provides a secure grip and that it will not burn the hand when the hot utensil is lifted. Every pan should be so balanced that it will not tip over when empty.

The size of top-of-the-range utensils is stated in terms of the capacity up to the brim, in quarts. The size of frying pans is stated by the top diameter in inches.

Take your time and compare prices before signing any contract with a cookware salesman. Door-to-door selling of utensils is a "high-pressure" operation and misrepresentation is, unfortunately, rife. Furthermore, the salesman may very often fail to give you all the information you need to understand the actual total price of the utensils he is selling you.

Above all, give no weight at all to claims that a given brand of pot or pan is practically indispensable to assure the family its desirable quota of vitamins or minerals. Each of the materials commonly used for cooking pans has its good and bad points. None is outstandingly superior in all important respects as salesmen and advertising would have you believe.

▶ **REF:** BULLETIN, Apr. '54, "Consider the Pan." • Selecting Cooking and Baking Utensils, 20 cents, from American Home Economics Association, 1600 20 St., N.W., Washington 9, D. C. • Standard for measuring utensils Z61.1-1949, Dimensions, Tolerances, and Terminology for Home Cooking and Baking Utensils, 35 cents, from American Standards Association, 70 E. 45, New York 17.

Aluminum

Aluminum cooking utensils heat quickly and evenly, hold heat well, especially if of medium or heavy weight, and are moderate in cost. Alkaline foods, hard water, soap and synthetic detergents leave a dark film on the surface which may be removed by scouring. Poorer grades of aluminum are especially susceptible to pitting when salty foods are cooked or stored in them. Strongly acid, alkaline, or salty foods had best not be prepared or stored in aluminum. Cast aluminum, of which many electric frypans are made, is rather difficult to keep clean because of its fairly rough surface.

It is not uncommon for salesmen of other types of ware to disparage aluminum cookware unfairly. The selling of aluminum ware is likely to be misleading, too. Within the past year, for example, Wear-Ever Aluminum, Inc., formerly the Aluminum Cooking Utensil Co., makers of *Wear-Ever* aluminum cookware, agreed to stop representing that the "waterless" method of cooking can only be done in aluminum utensils, that less food is required to satisfy hunger when *Wear-Ever* is used with the "waterless" method of cooking than when otherwise prepared, and that "the magnesium in food is 'nature's laxative' and if it is boiled out, laxatives must be purchased." (These claims are typical of those made by utensil salesmen handling other makes and materials, too.)

Stainless-steel cooking utensils

Stainless-steel vessels are expensive, but they are easy to clean and do not warp or dent easily. On the other hand, they heat slowly and unevenly and have a tendency to develop hot spots that may burn food.

Stainless-steel vessels, like those of aluminum, are misrepresented in selling. Rena-Ware Distributors, Inc., agreed to discontinue representations that all vitamins and minerals in food are retained when *Rena-Ware* stainless-steel cookware and the "waterless" method are used, and are destroyed by high temperatures used in other cooking methods; Towncraft Industries, Inc., was charged with misrepresenting the advantages of cooking with *"Chef's Ware"* stainless-steel cooking utensils by claiming that it assured good health and prevented illness, and with falsely disparaging aluminumware.

While stainless steels do remain cleaner and shinier with less attention than many other metals, they are *not,* strictly speaking, stainless or corrosion-proof. Salt and certain acids present in foods will attack the surface, discoloring it, carrying some of the metal into solution in the food, and possibly etching the surface of the utensil in a way to be readily visible. Rust may even appear on the surface. When the steel is etched, it means that some amount, usually slight, of chromium and nickel has been dissolved and has been mixed with the food cooked in the pan. The metal-contaminated food is, of course, eaten, usually day after day for many years.

The amounts of chromium, nickel, and certain other toxic metallic compounds that can be consumed by a human being over long periods without harm are not known with any degree of certainty. (Some hold that *none* should be ingested, if it can possibly be avoided.)

In tests to determine comparative resistance of stainless-steel utensils to food acids and salt, a boiling dilute tartaric-acetic-acid and salt solution of the kind reasonably representative of what is likely to be present in cooking was gently boiled in each pan for one half hour.

Since even the better stainlessware pans showed some loss of chromium and nickel in the tests reported, no stainless-steel pan was judged to warrant a rating higher than *B. Intermediate.* Those pans which yielded relatively large amounts of chromium in the tests are not recommended. Prices given include lids.

B. INTERMEDIATE

Bridgeport Copperware (Bridgeport Brass Co., Bridgeport 2, Conn.) $8.95. 1½-qt. stainless-steel pan with entire outer surface copper-clad. Loss of chromium and nickel to the solution, relatively low.

Farberware 811 (S. W. Farber Inc., 415 Bruckner Blvd., New York 54) $5.45. 1-qt. stainless-steel saucepan with aluminum-clad bottom. Best of all pans tested. Losses of chromium and nickel to the salt-acid solution used in the test, relatively low.

C. NOT RECOMMENDED

Ekco Flint-Ware, No. 7611 (Ekco Products Co., 1949 N. Cicero Ave., Chicago 39) $6.95. 1½ qt. On one sample, the loss of chromium and nickel was greatest of any of the pans tested. Other samples showed less loss. Some other samples of this brand examined subsequently showed marked corrosion and appearance of rust in acid-salt solutions.

Revere Ware, No. 1401 (Revere Copper & Brass Inc., Rome Mfg. Co. Div., New York City) $4.95. 1-qt. stainless-steel pan with copper-clad bottom. Loss of chromium and nickel to the solution, somewhat higher than average.

Sears "Maid of Honor" (Sears-Roebuck's Cat. No. 11—2255) $4.67, plus postage. 1½ qt. Loss of chromium and nickel, relatively high.

▶ **REF:** BULLETIN, Oct. '57.+++

MEAT THERMOMETERS

A meat thermometer eliminates the guesswork from meat roasting by indicating the degree of doneness. There are two kinds; one has liquid in a glass tube, the other has a dial and a metal stem. The liquid-in-glass thermometers keep their accuracy well over a period of time but are easily broken. The more expensive bimetallic (dial) thermometers are essentially unbreakable, but may become inaccurate if dropped or otherwise abused. Ratings are cr53.

A. RECOMMENDED

Ohio Hi-Lo Tested Roast Meat Thermometer (The Ohio Thermometer Co., Springfield, Ohio) 69c. Liquid-in-glass.

Taylor Roast Meat Thermometer, No. 5936 (Taylor Instrument Co., Rochester, N.Y.) $2; samples purchased at $3.15 and $1.85. Liquid-in-glass.

C. NOT RECOMMENDED

Chaney Tru-Temp Roast Meat Testing Thermometer, No. 291 (The Chaney Mfg. Co., Inc., Springfield, Ohio; sold by Sears-Roebuck's retail stores) $1. Liquid-in-glass.

Cooper Roast Meat Thermometer (Cooper Thermometer Co., Pequabuck, Conn.) $2.50. Bimetallic.

Taylor Roast Meat Thermometer, No. 5939 (Taylor Instrument Co.) $3.50. Bimetallic.

Tel-Tru Roast Meat Thermometer (Tel-Tru Mfg. Co., formerly division of Germanow-Simon Machine Co., Rochester 3, N.Y.) $3. Bimetallic.

Weksler Roast Meter Thermometer, No. 243 (Weksler Thermometer Corp., 195 E. Merrick Rd., Freeport, Long Island, N.Y.) $1.95. Liquid-in-glass.

High fidelity and records

Stereophonic sound • selection of components • tuners • amplifiers speakers • suggested home systems • record changers • tape recorders

HIGH FIDELITY

There is much more to true high fidelity than sound being projected at thunderous volume out of two or three assorted loud-speakers. At first glance, the principal differences between a high-fidelity music system and a 10-year-old record player may seem to be in outward appearance only. However, a little time taken to listen closely to a real hi-fi system will reveal the more important differences.

You will notice a new and impressive true-to-life quality of record reproduction, noticeable as good volume, especially in the bass register, where most ordinary equipment is weak. Second, you will gradually notice that records played by a real high-fidelity system have a smooth, easy-to-listen-to quality. They can be enjoyed for hours on end without "listening fatigue."

One reason the hi-fi assembly sounds so much better is because distortions added by the various electrical and mechanical components to the music you hear have been reduced to a minimum. Reduction in distortion makes music much more pleasant to listen to. Another reason concerns the difference in the *range* of sounds (frequency response) each system can reproduce. It is likely that the hi-fi system reproduces an extra octave at both the bass and treble ends of the sound spectrum. As a result, musical instruments sound more as they do in the concert hall, rather than muffled, thin, or unreal.

It is not difficult to improve frequency response, but it *is* difficult to attain a proper balance between the low and high frequencies. It is probable that your old system, at best, provided reasonably clean response between about 80 and 6000 cycles per second. More likely, it cut off at about 5000 cycles. Even a moderate-priced high-fidelity assembly will reproduce music satisfactorily over the range from 50 to 12,000 cycles, which is considered ample by most listeners. Of course, if you need not be restrained by high costs, even greater improvements in response range and greater reductions in distortion can be obtained, at considerably higher outlays.

STEREOPHONIC SOUND

Stereophonic sound reproduction though not new in principle is now being promoted as the latest thing in high-fidelity sound. In practice, the sound to be recorded is picked up by two or more microphones located in different sections of the orchestra or chorus, and the sound from each section is recorded as a separate "channel." When the two or three channels are played back through separate amplifiers and sent to separate speakers, placed in the same spatial relationship as were the microphones, the reproduction of sound is very lifelike both as to faithfulness of sound and awareness of the direction from which it comes.

The separate channels may be recorded on tape, each channel on one half of the tape width, or in a newer development on the two walls of the groove of an LP disk. For tape playback, two pickup heads are needed on the machine; with the disk, a special pickup cartridge is used. In both cases, a separate amplifier and speaker or speaker group is needed for each channel.

Manufacturers and dealers are trying hard to tie stereo sound to high fidelity in the buyer's mind so that all stereo reproduction will be associated with the concept of high fidelity. Actually, the recording or playing back of sound stereophonically does not in any way guarantee high fidelity. As in monaural sound, the quality of the reproduced music is only as good as that of the individual components through which it is played.

Stereophonic tape has been around for several years, but the high cost of a good tape recorder and the recorded tapes restricted the use of tape-recorded music to those who did not have to consider cost. Recording on and reproducing from disks gives promise of fairly satisfactory results from a system of much lower cost. It is our view, however, that it may be several years at least before a fully satisfactory and a reasonably stable system for playing stereo disk records will be available. One problem is compatibility. At present, a stereo disk can be played only with a special stereo pickup. To play one on monaural equipment with an existing pickup may ruin the record for future stereo playing. As to playing a regular LP record with a stereo pickup, the quality of reproduction is likely to be seriously deficient. In view of these considerations and particularly the newness of the disks and equipment involved, we believe anyone who buys now is running the risk of finding his purchase reduced in value, perhaps even rendered obsolete, by important and drastic changes in method or equipment.

In our view only engineers and "hi-fi bugs" with funds to spare and ability and ingenuity in the high-fidelity field should invest at the present time in a stereophonic system. The improvement of musical quality is significant, but we believe that the enhanced musical effects are not yet such as would justify the average listener in spending two or three hundred dollars for it. (A real devotee of stereophony might want to put a thousand dollars or so into his equipment.) Any make or type of stereophonic system, at least for some years to come, will be expensive in first cost and for maintenance, if quality of its sound output is to be comparable to that of a good monaural sound system.

FACTORY vs. HOME ASSEMBLY

Briefly, and contrary to claims in hundreds of advertisements, there are only a very few assembled (ready-to-play) units available which can be rightfully classified as high fidelity (see pages 174-175). The few that are good will cost far more than a home-assembled system of comparable quality. One can assemble for little more than $200 a good record-playing system, consisting of a changer with pickup, an amplifier and a speaker system. For $500, the hi-fi devotee can assemble a system which is superior to practically anything manufactured as a ready-made radio-and-record player. For the very best, you can spend well over $2000, and another thousand or so if you want to go in for stereophonic or binaural listening to fine music. Probably not one person in a thousand, however, will be capable of distinguishing between the $500 system and a $2000 one.

SELECTION OF COMPONENTS

The first decision to be made when assembling a hi-fi system is the amount of money you can afford to spend. Second, you must decide whether you just want a record player or whether, in addition, you will want AM, FM, or AM-FM radio facilities, and possibly a tape recorder also. Once these decisions have been made, you may reasonably apportion your expenditures about as follows:

Record player — 20 percent for changer and cartridge, 30 percent for amplifier, 50 percent for speaker system.

Record player with AM or FM radio—15 percent for changer and cartridge, 20 percent for amplifier, 45 percent for speaker system, 20 percent for AM or FM tuner.

Record player with AM-FM radio—15 percent for changer and cartridge, 25 percent for amplifier, 35 percent for speaker system, 25 percent for AM-FM tuner.

The percentages given for the speaker system include an amount sufficient to construct a suitable speaker enclosure, if one is not purchased ready made. Substantial amounts can be saved by the purchase of components in kit form. Anyone with a very moderate amount of mechanical aptitude and ability can assemble one of the recommended kits.

Some suggested systems

The systems included in this section were selected from components that Consumers' Research has tested and found worthy of recommendation. They are complete for record playing; a radio tuner can be added now or at a future date to make a complete home music system. CR has listed a minimum cost system, a compact system for those who want excellent reproduction but have limited space for equipment, and a medium high-priced system for those who have both the money and space to provide for such components. For those to whom cost is no object, there is listed a system made up of the ultimate in components meant for use in the home. Prices given are those advertised by mail-order radio parts distributors, and are rounded off to the nearest dollar (postage or shipping charges are not included).

Minimum cost phono system ($220). *Collaro RC*

440 record changer with mounting base and *General Electric VR-II* variable reluctance pickup, $55. *Bogen DB-110* 10-watt amplifier, $60. *Electro-Voice SP12-B* 12-inch speaker in *Electro-Voice Aristocrat* corner horn enclosure, $105.

Compact system ($377 to $588). *Garrard RC88-4* record changer with base and *General Electric VR-II* variable reluctance cartridge (diamond and sapphire stylus), $77, or *Rek-O-Kut L-34* turntable with base, *Livingston Universal* arm, and *GE* cartridge (diamond and sapphire stylus), $128. *Bogen DB-130* 35-watt amplifier, $115. *Acoustic Research AR-1* loud-speaker, $185. If desired, *H. H. Scott 300* AM-FM tuner, $160.

Medium-high-priced system ($681). *Rek-O-Kut L-34* turntable with base, $87. *Fairchild 280A* arm, *Fairchild 225* cartridge (diamond stylus), $75. *H. H. Scott 210-F* 36-watt amplifier, $190. *Acoustic Research AR-1W* and *Janszen 1-30M* combination loud-speaker system, $329.

High-priced deluxe system ($1307). *Rek-O-Kut B-12H* turntable with base, $163. *Pickering 190D* arm with *Pickering 350DD* cartridge, $86. *McIntosh C-8* preamplifier control unit, $89. *McIntosh MC-60* 60-watt amplifier, $199. *Bozak B-310A* loud-speaker system, $770.

Because of necessary space limitations in this *Annual*, CR has tabulated the essential information on tuners, amplifiers, speakers, and pickup cartridges, and given references to the original reports on the particular items.

The listings that follow include equipment in low-, medium-, and high-price ranges. Since there has been a considerable improvement in all types of hi-fi equipment in the past five years, and there is more public demand for equipment in the low- and medium-price ranges, CR has included these components along with those items which are judged to be "tops" or nearly so. Contrary to CR's usual policy, the price of an item in this field is considered when arriving at a rating. Thus, it is entirely possible that a $100 loud-speaker considered a poor buy at that price might be worthy of a higher rating when compared with a $25 speaker of the same size.

RADIO TUNERS

One of the sources of program material to be reproduced through a high-fidelity system is, naturally, the local radio station. A basic tuner may be considered a highly refined table-model radio with the audio amplifier and speaker omitted. Tuners are available which provide for many different functions. Provision for AM or FM or both AM and FM reception may be present. Some models will include tone controls and preamplifying stages, and in some new models the manufacturers have even put the power amplifier and tuner into a single package. Remember that AM broadcasting at best can offer only limited tonal quality.

FM broadcasting, on the other hand, is inherently free from interference and can provide high-quality musical reproduction. There are indications that interest in the FM medium may be on the upswing again. During the past two years, there has been an increase in the number of FM stations on the air, and many FM stations throughout the country have greatly improved their programs and broadcast fidelity.

TUNERS

BRAND AND MODEL	BASIC	PREAMPLIFIER AND TONE CONTROLS	AM	FM	PRICE, $	SOURCE OF RATING	REFERENCE*
A. Recommended							
Realistic FM	•			•	40	OS	
Bogen AM90	•		•		75	OS	
Bogen R-620	•		•	•	85	OS	
Browning L-300	•			•	88	CR	9/55
Fisher FM-40	•			•	100	CR	56–57
Scott 311	•			•	100	OS	
Pilotuner AF-825	•	•	•	•	130	OS	
Sargent Rayment SR-100	•		•	•	140	OS	
Sherwood S-2000	•		•	•	140	OS	
Fisher FM-80	•			•	140	OS	
Bell 2210	•		•	•	142	OS	
Bogen R750	•	•	•	•	150	OS	
Scott 301-A	•			•	150	CR	5/56
Stromberg-Carlson SR401	•		•	•	150	CR	9/55
Sargent-Rayment SR-51B	•		•	•	155	CR	3/53
Fisher FM 90X	•			•	170	OS	
Newcomb 200	•		•	•	170	OS	
Browning RJ-43	•		•	•	180	OS	
Pilotuner AF-860	•	•	•	•	180	OS	
National Criterion	•	•	•	•	190	CR	5/56
Scott 330	•		•	•	200	OS	
Sargent-Rayment SR-808	•	•	•	•	236	OS	
Fisher 500**	•	•	•	•	250	OS	
R.E.L. 646C	•			•	325	CR	5/56
B. Intermediate							
Heathkit FM-3 (kit)	•			•	26	AL	
Knight FM (kit)	•			•	39	OS	
Pentron AFM	•	•	•	•	90	OS	
Sargent-Rayment SR68	•		•	•	178	CR	54–55
C. Not Recommended							
Miller TRF (kit)	•		•		20	CR	5/48

*—Month and year of Bulletin (e.g., 9/55) or issue of *Annual* (e.g., 54-55) in which test was reported.

**—Combination tuner and amplifier.

CR—Item tested or rated by Consumers' Research.

AL—Information from Audio League Reports.

OS—Basis for rating is from outside sources or on results of limited observations by CR's audio engineers and are to be considered as providing a lesser degree of certainty than ratings based on actual tests by CR or AL.

AUDIO AMPLIFIERS

There is a growing trend among amplifier manufacturers toward the production of higher and higher powered amplifiers. Outputs of 50, 60, or 70 watts are not uncommon, and one manufacturer even makes a 125-watt amplifier for home use. It is doubtful whether anyone could have any possible need for 125 watts of power capacity except for an auditorium or an out-of-doors installation. However, the 50- or 60-watt amplifiers, which are designed for excellent reproduction at their maximum powers, will give superb operation at normal listening levels (which is of the order of 5 watts or less). The consumer will pay far higher prices for amplifiers having so much excess capacity.

AMPLIFIERS

BRAND AND MODEL	RATED WATTS	BASIC	PREAMPLIFIER	TONE CONTROLS	COMPENSATOR	PRICE, $	SOURCE OF RATING	REFERENCE*
A. Recommended								
Knight-Kit Economy	10	•	•	•		24	OS	
Pilot AA-902	10	•				40	OS	
Heathkit W-3M (kit)	20	•				50	CR	57–58
Pilot AA-410	15	•				50	OS	
Craftsmen CA-11	10	•	•	•	•	58	OS	
Bogen DB110	12	•	•	•	•	60	CR	9/56
Fisher 20-A	15	•				60	OS	
Heathkit W-4 (kit)	20	•	•	•	•	60	OS	
Heathkit W-5M (kit)	25	•				60	CR	4/57
Lafayette LA-59	18	•	•	•	•	65	OS	
Dynakit MK II (kit)	50	•				70	OS	
Brociner Mark 10	10	•	•	•	•	75	CR	9/56
Bogen DB-115	15	•	•	•	•	80	OS	
Dynakit MK III (kit)	60	•				80	CR	58–59
Pilot AA-903	14	•	•	•	•	80	OS	
National Horizon 20	20	•				85	OS	
Bell 2256	12	•	•	•	•	88	CR	9/56
Sargent-Rayment SR88	15	•	•			89	CR	54–55
Brociner Mark 12	12	•	•	•	•	98	OS	
Bogen DB-20	20	•	•	•	•	99	OS	
Brociner Mark 30A	27	•				100	CR	4/57
Fairchild 255	25	•				100	CR	4/57
Fisher 80AZ	30	•				100	CR	4/57
Scott 99B	22	•	•	•	•	100	OS	
Leak TL/10	10	•	•	•	•	107	AL	
Heathkit W-6M (kit)	70	•				110	CR	58–59
Stromberg-Carlson AR-420	25	•	•	•	•	110	OS	
Bogen DB-130	35	•	•	•	•	115	CR	4/57
Electro-Voice A20C	20	•	•	•	•	122	OS	
Techmaster 19	60	•	•	•	•	127	OS	
Gray AM-50	50	•				130	OS	
McIntosh MC-30	30	•				144	CR	4/57
Bell 3DTG	10	†				147	OS	
Fairchild 260	50	•				150	OS	
Fisher 55A	55	•				170	OS	
Scott 210F	36	•	•	•	•	190	OS	
Newcomb 1500R	15	•	•	•	•	198	OS	
McIntosh MC-60	60	•				199	CR	58–59
Acoustical Quad II	15	•	•	•	•	238	OS	
Scott 280	80	•				230	CR	58–59
Newcomb 2500R	25	•	•	•	•	298	OS	
B. Intermediate								
Heathkit A-9B (kit)	20	•	•	•	•	36	OS	
Bell 2122C	10	•	•	•	•	53	CR	9/56
Stromberg-Carlson AR-411	12	•	•	•	•	60	CR	9/56
Pilot AA900	10	•	•	•	•	68	OS	
National Horizon 10	10	•	•	•	•	80	OS	
Sonotone HFA-150	15	•	•	•	•	80	OS	
Stromberg-Carlson AR-415	11	•	•	•	•	90	CR	9/56
Fisher 200	60	•				180	CR	58–59
C. Not Recommended								
Realistic AF-10	10	•	•	•	•	30	CR	9/56
Bogen DO-70	70	•				130	CR	58–59

*—Month and year of Bulletin (e.g., 9/56) or issue of *Annual* (e.g., 54-55) in which test was reported.
†—Stereo-amplifier.
CR—Item tested or rated by Consumers' Research.
AL—Information from Audio League Reports.
OS—Basis for rating is from outside sources or on results of limited observations by CR's audio engineers and are to be considered as providing a lesser degree of certainty than ratings based on actual tests by CR or AL.

An amplifier capable of supplying 10 watts of power with a minimum of hum and distortion is ample for all but multiple-room or auditorium-style or out-of-door installations. (There are a few speaker systems, too, such as the *Acoustic Research AR-1,* which because of their low efficiency may require use of a more powerful amplifier if unusually loud listening levels are desired.) The design should be such that tonal quality and purity are maintained at the chosen power level over the whole range of usable frequencies, say 40 to 12,000 cycles per second.

A "basic" amplifier simply makes more powerful the signal which is fed to it. It is meant to be used with either a radio tuner, or a separate control box which includes a tone-control section and may include a preamplifier.

Many amplifiers have built-in tone-control circuits and a preamplifier (so-called "front ends," which comprise the additional circuits needed to preamplify the very small electrical currents coming from a magnetic pickup, and to provide for control of the "balance" of bass and treble). In still others, there are special circuits which provide the means for compensating for the particular characteristics of the particular phonograph record being played.

LOUD-SPEAKERS

The loud-speaker and its enclosure are likely the most critical elements in a high-fidelity system. They should, therefore, represent the largest share of the total cost of your system. Many of the new systems now available employ three, even four or more, speakers to cover the audible range. The number of speakers, however, is not itself a safe criterion for judging the quality of any sound system. An incorrectly-mounted speaker is no more useful than an automobile tire that does not fit its rim. To get the best performance, a speaker must be properly housed or "baffled." Where enclosure space is limited, the so-called bass-reflex cabinet with a "tuned port" or opening is preferred for home construction. The so-called infinite baffle is preferable to the bass-reflex enclosure but the fact that it is necessarily much larger will rule it out in many homes.

A number of problems may be encountered in assembling a speaker system which are beyond the scope of knowledge of the non-specialist. On that account, if you are not an audio engineer or a technically-informed consumer, you would be well advised to purchase a completely integrated speaker system rather than try to assemble your own woofer-crossover-tweeter system from several brands.

In CR's opinion, the best speaker systems now available for the home are the large horn-loaded *Klipschorn*, the *Bozak B-310M* (a very large unit in an "infinite" baffle), and the small, compact, *Acoustic Research AR-1*.

SPEAKERS

BRAND AND MODEL	SIZE	ONE CONE	TWO WAY OR THREE WAY	RATED WATTS	PRICE, $	SOURCE OF RATING	REFERENCE*
A. Recommended							
Stentorian HF1D12	10	•		10	16	OS	
Stentorian HF1012	10	•		10	18	OS	
General Electric 1201A	12	•		25	23	CR	2/49
PanaSonic	8	•			25	OS	
University Diffusicone 8	8	•		25	25	OS	
Jensen K-210	12		•	14	27	CR	4/51
Lansing D208	8	•		12	28	CR	51–52
Electro-Voice SP8-B	8	•		20	29	OS	
Stephens 80FR	8	•		20	32	OS	
Electro-Voice SP12-B	12	•		20	34	CR	4/51
University Diffusicone 12	12	•		30	36	CR	52–53
University 308	8		•	25	39	OS	
Jensen K-310A	15		•	16	40	OS	
Stentorian HF1214	12	•		15	50	OS	
Norelco 9762M	12	•		20	59	OS	
Jensen H-222	12		•	25	62	OS	
Electro-Voice SP12	12	•		25	65	CR	4/53
Hartley 215	9	•		25	65	CR	4/51
University 312	12		•	25	69	OS	
Lansing D-131	12	•		20	78	CR	53–54
Jensen H-520	15		•	25	80	OS	
Bozak B207A	12		•	15	84	OS	
Lansing D-130	15	•		25	84	CR	4/53
Electro-Voice SP15	15	•		30	87	CR	4/53
Acoustic Research AR-2	10†		•		96	OS	
Altec Lansing 601A	12		•	20	114	CR	53–54
Electro-Voice 12TRX	12		•	25	123	OS	
Altec Lansing 602A	15		•	20	114	CR	53–54
Heathkit SS-1-SS-1B	15†		•	35	140	OS	
Electro-Voice 15TRX	15		•	30	146	OS	
University 315C	15		•	50	153	OS	
Altec Lansing 604C	15		•	35	177	CR	2/49
Acoustic Research AR-1	12†		•		185	CR	5/56
Wharfedale SFB-3	12†		•		199	OS	
Jensen G-610	15		•	40	253	CR	4/51
Heathkit Legato (kit)	15†		•	50	300	OS	
Electro-Voice Aristocrat III (3-way system)	12†		•	20	306	OS	
Electro-Voice Regency III (3-way system)	15†		•	30	385	OS	
Lansing D35001G	15†		•	25	392	CR	53–54
University Classic (3-way system)	15†		•	50	466	OS	
Electro-Voice Georgian 600 (4-way system)	15†		•	35	480	OS	
Weathers Barrington	12†		•	60	495	OS	
Brociner, Model 4	12†		•		520	OS	
Altec Lansing 820A (2-way system)	15†		•	30	525	CR	52–53
Brociner Transcendent (3-way system)	15†		•		597	OS	
Klipschorn (3-way system)	15†		•		636	CR	2/49
Bozak B-310M (3-way system)	12†		•	50	770	CR	54–55
Electro-Voice Patrician (4-way system)	18†		•	35	803	CR	54–55
B. Intermediate							
Heathkit SS-1 System	8†		•	25	40	OS	
Stephens 112 FR	12	•		20	44	CR	4/53
University 6201	12		•	25	51	CR	52–53
JansZen Z-200	12†		•	50	329	OS	
Stephens E-3	15†		•	25	590	OS	

*—Month and year of BULLETIN (e.g., 5/56) or issue of *Annual* (e.g., 54-55) in which test was reported.
†—Includes enclosure.
CR—Item tested or rated by Consumers' Research.
AL—Information from Audio League Reports.
OS—Basis for rating is from outside sources or on results of limited observations by CR's audio engineers and are to be considered as providing a lesser degree of certainty than ratings based on actual tests by CR or AL.

In those instances in the tables in which only the speaker is listed, without enclosure, it is suggested that the manufacturers' recommendation of enclosure size and type be followed. Information on suitable enclosures for a given speaker is usually available from the speaker manufacturer.

The wattage rating of a speaker gives an indication of the amount of power it can handle safely. When choosing a speaker, make sure its wattage rating is at least equal to that of the amplifier with which it will be used. Replacement of a burned-out voice coil in an expensive woofer (low-frequency speaker) or tweeter can be costly.

In the final analysis, a speaker system is only as good as it sounds to you in your home. CR's ratings of the various speakers are meant to be used as a guide, but your final choice from among them should be based upon the way the speaker system sounds to you.

High-frequency speakers (tweeters)

A. RECOMMENDED

Electro-Voice T-25 (Electro-Voice, Inc.) $57. 20-30 watts. 16 ohms. 400 to 13,000 c.p.s. *Model X-8* crossover network, $31 extra.

Lansing "Acoustic Lens," Model 175-DLH (James B. Lansing Sound, Inc.) $119. *Model 175* driver only, $87. Rated 25 watts at frequencies above 1200 c.p.s. 16 ohms input impedance. cr53

B. INTERMEDIATE

Racon CHU-1 and CHU-2 Tweeters, CON-20 Crossover Network (Racon Electric Co., Inc., 52 E. 19, New York 3) Tweeters, $21.50 and $28.50; Crossover Network, $15.50.

University 4401 Tweeter and 4405 Filter (University Loundspeakers, Inc.) Tweeter, $18; Filter, $10.

High-fidelity headphone

A. RECOMMENDED

Brush 205 (Brush Electronics Co., 3405 Perkins Ave., Cleveland 14) $19.40.

Under-the-pillow speaker

B. INTERMEDIATE

Hushatone, Model BA-301 (Brush Electronics Co.) $7. Considered satisfactory for use in sickrooms.

RECORD-PLAYING COMPONENTS

The very best reproduction from a record will be had by the use of a well-constructed turntable and a good pickup arm. Record changers are, however, popular among those who are not out-and-out devotees of high fidelity. The price of a turntable may range from $32 for the very satisfactory *Garrard Model T* to $250 for the professional quality *Rek-O-Kut B-16H*. The *Scott 710* at $140 is an excellent choice in the medium price class. Among record changers, the new *Garrard RC-88* ($53.50), with provision for manual play, is to be preferred.

There are several professional-type pickup arms which are suitable for use with the professional-type turntables. The *Pickering 190-A* is low in price and will accommodate any of the more popular pickup cartridges. If you purchase a good turntable, select an arm of comparable quality.

Several magnetic cartridges of excellent quality (*General Electric, Fairchild,* and *Pickering,* for example) are widely sold. A magnetic cartridge, because its output is low, will require a preamplifier, either built into the amplifier or as a separate unit.

Preamplifiers are built into most of the hi-fi amplifiers sold today. When the preamplifier is a separate unit, it is best to choose one of the same make as the cartridge. The *General Electric UPX-003B,* for example, is a good choice with the *GE* cartridge.

The principal advantages of the new high-fidelity ceramic cartridges are their relatively flat frequency characteristic, high output (which means that most will *not* require a preamplifier), and freedom from hum pickup. The best ceramic pickups are judged the equal of some of the better magnetic pickups. Few listeners will be able to distinguish the two types, as to quality of reproduction.

Both kinds of cartridges are available either with a single stylus (.001 inch for 33⅓ and 45 rpm. records or .003 inch for 78 rpm.) or as a dual type with both styli. Separate cartridges are usually mounted in separate "plug-in" heads (the *Pickering 260* is an exception); the dual-styli type remains in place. Most are available with either sapphire or diamond styli. CR recommends that all who can afford to purchase a pickup with diamond stylus should do so (see page 173).

Although the record manufacturers now use a standard recording characteristic, most hi-fi fans will find need for a record compensator whether a ceramic or magnetic pickup is used if they wish to play most of the older records (vintage pre-1955). The compensator permits the listener to select an appropriate playback characteristic for the record being played. Bass and treble tone controls are helpful but are not likely to give as good results as a good compensator.

Phonograph turntable units

A good turntable will operate smoothly and evenly at a constant speed, little affected by small variations in load imposed by the cartridge or by slight fluctuations in line voltage. A shaded-pole synchronous motor, having 4 poles, or the more expensive hysteresis-synchronous type (about $50 extra, the smoothest-running kind, often used in semiprofessional turntables) is recommended to minimize hum radiation to a magnetic cartridge.

A. RECOMMENDED

Rek-O-Kut, Model B-16H (Rek-O-Kut Co., Inc., 38-01 Queens Blvd., Long Island City 1, N. Y.) $250. 3 speeds. Hysteresis motor. 16-in. turntable. **AA3**

Rek-O-Kut, Model B-12H (Rek-O-Kut Co., Inc.) $130 with hysteresis motor; $85 with 4-pole, induction-type motor. 3 speeds. 12-in. turntable. 3

Scott, Model 710 (H. H. Scott, Inc., 385 Putnam Ave., Cambridge, Mass.) $125. 3 speeds. 4-pole shaded-pole motor. 12-in. turntable. Unique in that stroboscope and vernier speed adjustment are built in. 3

Record changers

Record changers have certain deficiencies in performance and effects on record life not present in good turntables.

A changer should be mounted with its turntable level and with the pickup cartridge carefully installed according to instructions to assure the best possible tracking.

A. RECOMMENDED

Collaro RC 440, Coronation (Distributed by Rockbar Corp., 650 Halstead Ave., Mamaroneck, N. Y.) $40.67, less pickup cartridge. Four-speed changer, 12 x 13½ in.; four-pole motor; plastic plug-in head for pickup cartridge. Plastic tone arm. Random intermixing of all sizes of records of same speed. 45 rpm. spindle available at $3.23. Speed regulation, satisfactory. Wow, flutter, and rumble, very low. Changer shuts itself off at the end of the last record. Judged a well-made changer. 3

Garrard RC-88, Triumph II (Garrard Sales Corp., 80 Shore Rd., Port Washington, N.Y.) $53.41, less cartridge. Four-speed changer; four-pole motor; two plastic plug-in heads for use of separate pickup cartridges; tone arm made of aluminum. 45 rpm. spindle available at an extra charge of $3.43. This *Garrard* does not play "intermixed" records. Speed regulation, satisfactory. Wow and flutter and rumble were very low. Changer shuts itself off at end of last record. Judged a well-made changer with better-than-average performance. 3

Garrard RC-98, Crown II (Garrard Sales Corp.) $66.15, including 45 rpm. automatic spindle but less pickup cartridge. This changer is a de luxe version of the *Garrard RC-88 Triumph II* and is essentially the same, except that it has a control to permit the user to vary each selected speed to adjust the pitch on reproduced music to the exact point desired. 3

Webcor Magic-Mind BR 1831-1 (Webcor, 5610 W. Bloomingdale Ave., Chicago) $42.63, less cartridge. Four-speed changer; four-pole motor; tone arm made of aluminum. Spindle-drop. This changer will automatically select the proper speed and play intermixed 7-, 10-, and 12-in. records of 45 and 33⅓ rpm. Automatic spindle for 45 rpm. records available at $2.94. Changer shuts itself off at end of last record. Speed regulation, satisfactory. 3

B. INTERMEDIATE

V-M Super Fidelis 1200 A (V-M Corp., Benton Harbor, Mich.) $37.20, including turnover ceramic pickup cartridge. Four-speed changer; tone arm made of aluminum. Automatic spindle for 45 rpm. records available at $1.92. Speed regulation is satisfactory. The two-pole motor became very hot during tests (undesirable). Wow and flutter were low, but some rumble was noticeable. Changer shuts itself off after the last record is played. 2

Webcor Magic-Mind BR 1841-1 (Webcor) $33.45, including turnover ceramic cartridge. Similar to *Webcor BR 1831-1* except has two-pole motor. Some wow present, and rumble was noticeable. Changer shuts itself off at the end of the last record. 2

Garrard RC-121, Renown (Garrard Sales Corp.) $41.65, less pickup cartridge. Four-speed changer; four-pole motor; tone arm made of aluminum. Permits intermix of all sizes of records of same speed if stacked in predetermined order of record size. Automatic spindle for 45 rpm. records available at $3.43. Speed regulation, satisfactory. Wow and flutter were low, but some rumble was noticeable. Changer shuts itself off after the last record. Well designed but not assembled with the high grade of workmanship usually associated with *Garrard* changers. 3

▶ **REF:** BULLETIN, March '58.

CARTRIDGES

BRAND AND MODEL	MAGNETIC	CERAMIC	SINGLE STYLUS	DUAL STYLI	PRICE WITH DIAMOND STYLI WHERE AVAILABLE, $	SOURCE	REFERENCE*
A. Recommended							
Electro-Voice 84D		•	•		23	CR	8/55
Fairchild 225A	•		•		38	CR	57–58
Fenton 350	•				25	OS	
General Electric VR-II	•			•	30	OS	
Pickering 240	•		•		38	CR	8/55
Pickering 260	•			•	60	CR	57–58
Pickering 350	•			•	54	CR	57–58
Sonotone 3P		•	•		14	AL	
Sonotone 3T		•		•	14	AL	
Weathers		†	†		92	OS	
B. Intermediate							
Astatic 51-1J		•	•		4‡	CR	8/55
Recoton 500 SDM	•			•	23	AL	
Sonotone 1P		•	•		13	CR	8/55
C. Not Recommended							
Fenton 350A	•				22	OS	

*—Month and year of BULLETIN (e.g., 8/55) or issue of *Annual* (e.g., 57-58) in which test was first reported.
†—Special design.
‡—Sapphire stylus.
CR—Item tested or rated by Consumers' Research.
AL—Information from Audio League Reports.
OS—Basis for rating is from outside sources or on results of limited observations by CR's audio engineers and are to be considered as providing a lesser degree of certainty than ratings based on actual tests by CR or Audio League.

Preamplifiers, equalizers, and compensators

A. RECOMMENDED

General Electric UPX-003B Preamplifier (General Electric Co., Syracuse) $10.55. Adequate preamplification and equalization for *GE* and other magnetic pickups. Includes a self-contained power supply for operation directly from 115-volt 60-cycle line. 1

Pickering 132 E Record Compensator (Pickering & Co., Inc., Oceanside, N.Y.) $12. Used with preamplifier to improve record playback quality when wide-range low-distortion equipment is used. 2

Phonograph pickup arms

A. RECOMMENDED

Pickering 190 (Pickering & Co., Inc., Oceanside, N.Y.) $31.50. Easily mounted. Has plug-in cartridge feature and adjustable height. Tracked very well on warped records, and no groove-jumping. When used with *Pickering* cartridges, considered at least equal to or better in several respects than other pickup arms tested. AA3

Clarkstan 212G (Clarkstan Corp., 11927 W. Pico Blvd., Los Angeles 34) $22. Adjustable, sliding-weight counterbalance. Direct insertion of almost any magnetic cartridge without screws, mounting plates, or brackets of any kind. Otherwise, a conventional arm of sturdy construction and good performance. Convenient. 3

Livingston "Universal" (Livingston Electronics, Livingston, N. J.) $25. Curved arm of good tracking and low friction characteristics. Stylus pressure can be varied, but not readily. No plug-in feature. Very satisfactory when properly used. 3

Stylus-pressure gauges

Clarkstan Phono-Needle Pressure Gauge (Clarkstan Corp.) $1.50 net. Double scale, 0.28 g.; 0.4 oz.; accuracy within 10%. 1

Livingston Phono-Needle Pressure Gauge (Livingston Electronics) $2 net. 0.30 g.; accuracy within 10%. 1

Phonograph styli

Practically all of the better pickup cartridges for use with the LP (microgroove) records are supplied with sapphire- or diamond-tipped styli. There is also a trend toward designing the better cartridges so that the user can replace the stylus at home. In the new *GE* cartridges, for example, the stylus tip is made as a separate part which is simply slipped off the shank assembly and replaced by a new one.

Stylus wear is a very important consideration, especially with microgroove records. A stylus that is worn or becomes chipped works quick and permanent damage to the record surface and causes distortion of music; it should be taken out of service at once.

Although jewel-tipped styli wear at a relatively rapid rate, their useful life will be far greater than that of so-called "permanent" or precious-metal needles. It is economically advantageous, however, to use a properly polished *diamond stylus,* which, with normal use, will give from 400 to 1500 hours or more of service life—as against only about 15 hours for the sapphire—and thus a lower cost per play. *A good, unworn diamond* does not wear records at a higher rate than a new sapphire stylus.

It is important that any stylus be examined carefully with a low-power microscope (10 to 20X) when it is new, and thereafter at regular intervals. Flats appear, even on diamond styli, but do no harm so long as they are not large. The stylus should preferably be examined while still mounted in the cartridge. (If the stylus is removed and reinserted in such a way that it does not take precisely the same position it had before, the edge of a flat worn on the stylus can do quick and serious damage to a record.)

To determine whether records are being worn unduly, one should observe the record surfaces carefully as they are played, for signs of a fine dust or powder, or color change (graying).

SERVICING PROBLEMS

The low-distortion, wide-range reproduction of high-fidelity equipment often means that certain deficiencies cannot be tolerated in radio tuners, recorders, or amplifiers, even though these faults would be unobjectionable in commercial radio receivers and record players. Occasional preventive maintenance is a good idea. The condition of tubes and intercomponent cabling, for example, should be checked once a year, the pickup perhaps every 2 or 3 months. Output tubes in a high-power amplifier may need balancing from time to time. Record changers and tape recorders are complicated mechanisms and are likely to need adjustment more frequently than other components.

There are special agencies that will service high-fidelity equipment. Most of them, located in large metropolitan areas, advertise in major newspapers and in various magazines that discuss high-fidelity topics. It should be noted that any serviceman who possesses the knowledge and instruments needed to align properly an FM tuner or other high-fidelity device will expect to be paid on a basis commensurate with his skill. Unless you are located in a large city, you will probably have to take or ship an ailing pickup, speaker, or amplifier some distance for proper adjustment and service.

The ability of many radio and television servicemen to repair high-fidelity components has improved as the need has increased. Indeed, in some cities, there are now some who specialize in hi-fi. Most magazines catering to the serviceman have increased their coverage of the subject and several now include articles, directed to the repairman, on the servicing of quality components. If there is no competent servicing agency near you, you may find someone at a local radio station or in the electrical engineering department of a local college or university who is capable of directing or carrying out the repair.

RECORD PLAYERS

As a result of the current boom in high fidelity, more factory-assembled record players are being sold than assembled component systems. Although the term high fidelity is widely used in manufacturers' descriptions of the new, widely-advertised record players, even some as low as $89, high-quality audio reproduction is not to be achieved with any of them in the under-$300 price range. Several of the so-called high-fidelity players do offer reasonably good reproduction, however, which is better than that obtainable from a good phonograph combination of 1946-1950 vintage. They can give many pleasant hours of listening pleasure to listeners who do not expect full hi-fi performance. Other players, despite claims to the contrary, offer only poor to mediocre reproduction.

The ratings of the following record players (all consoles except the *Pilot Encore PT-1015*) are based primarily on their ability to supply reasonably good fidelity in reproduction of music. Their performance is in the range between the usual radio-phonograph combination and one of the less expensive unit systems (see page 169). Note that use of a number of speakers does not assure good sound reproduction. Ratings are cr57.

A. RECOMMENDED

Motorola, Model 67HFK2 (Motorola Inc., Chicago) $230. 4-speed changer; ceramic cartridge. Quality of reproduction, above average. Volume of sound output, more than adequate. Tonal range and action of tone controls were satisfactory.

Pilot Encore PT-1015 (Pilot Radio Corp., Long Island City, N.Y.) $170. 4-speed changer; variable reluctance cartridge. Volume of sound output, adequate. Quality of reproduction, above average (excellent for a portable player).

Zenith, Model HFZ-18R (Zenith Radio Corp., Chicago 39) $200. 4-speed changer; ceramic cartridge. Volume of sound output, more than adequate. Quality of reproduction, above average except with treble range de-emphasized. A greater range of tone control action would be desirable.

B. INTERMEDIATE

Magnavox, Model CP271C (Magnavox Co., Fort Wayne 4, Ind.) $160. 4-speed changer; crystal cartridge. Capable of pleasing reproduction at moderate volume. Objectionable cabinet rattle at high volume level. Tonal range and action of tone controls were satisfactory.

C. NOT RECOMMENDED

Fisher, Model 50M (Fisher Radio Corp., Long Island City, N.Y.) $265. 3-speed changer; variable reluctance cartridge, good. Potentially, an excellent player, but appreciable hum was present in the two samples CR tested. (Hum is definitely an undesirable characteristic.)

RCA, Model 7HF4 (RCA Victor Radio and "Victrola" Div., RCA, Camden 8, N.J.) $180. 4-speed changer; ceramic cartridge. Quality of reproduction, mediocre. Leakage current (1.2 ma.) was excessive.

VM Fidelis, Model 565 A (VM Corp., Benton Harbor, Mich.) $220. 4-speed changer; ceramic cartridge. Over-all performance judged to be below average. Single tone control was not considered adequate in this general class of equipment.

▶ **REF:** BULLETIN, June '57+++, Nov. '57+.

RECORD CARE

The fine-grooved records must be handled with great care to prevent scratching. Noise-producing dust particles are best removed from a record with a circular wiping motion each time before use with a very slightly moistened soft cloth or chamois. The record should be dried immediately with a dry, soft, lintless cloth.

Following are some basic rules for proper care of fine-groove records.

1. Play fine-groove records *only* at the proper speed (33⅓ or 45 rpm.).

2. Use a pickup (preferably "lightweight") equipped with an unworn stylus (preferably diamond) having a tip radius of 0.001 inch ("1 mil").

3. Be certain the stylus and cartridge are in proper alignment.

4. Always handle an LP record by its edges or by one edge and the center—*never touch the grooves*. Be sure that the hands are free of grease, dust, and grit.

5. Buckle the record jacket when removing or replacing a disk. Store each record on its edge, vertically, in its envelope, away from heat. Plastic bags are available for individual records (20 for $1). They offer excellent protection against dust.

6. The turntable mat should be clean.

7. Lightly clean the tip of the stylus each time a record has been played.

8. Use particular care that the pickup does not scratch across the record.

9. Don't clean records with alcohol, naphtha, or other household cleaning fluids.

Goodell Record-Life and *Walco Stati-Clean* are liquid materials available for treating records by eliminating static charges, so that they will not tend to attract dust. Whether the use of such a liquid is worth the time and expense involved is a matter for the individual record collector to decide for himself. They do work, but their proper application is not simple.

Some devices sold for eliminating static utilize a radioactive substance, such as polonium. In the hands of an informed and careful adult, properly and carefully used, such devices appear to present no particular danger. They do present a real hazard if anyone should tamper with them or permit a child to do so or to play with the device. Serious, lasting injury from such radioactive material is easily possible. Treat the device as though it were an active poison and under no circumstances leave it where a child might have access to it.

TAPE RECORDERS

Whether you spend $100 or $1000 for a tape recorder, it is likely that you will have many enjoyable hours of listening pleasure from your own recordings. If you want a tape recorder primarily for high-fidelity reproduction of music from commercially available pre-recorded tape, you will need a recorder at $500 to $600 or more, of the type used by professionals, broadcast stations, and others who can afford top-grade equipment.

A modern tape recorder combines a complicated mechanical instrument with intricate electronic circuitry. To provide reasonable ease of operation, several manufacturers have combined the needed controls in push buttons or a keyboard. Because of the complexity, any recorder is likely to require fairly frequent servicing if it is to be kept in good operating condition.

Top-quality recorders, such as *Ampex* and *Magnecorder*, are capable of recording and reproducing music (when used with first-rate amplifier and speaker) with superb tonal quality.

Don't expect an audible frequency response of

30 to 12,000 cycles per second (as claimed by some) from any recorder with self-contained speaker. A useful output from 125 to 10,000 cycles per second is as good as can be expected. However, with use of an external amplifier and a good loud-speaker system, performance could be improved greatly.

There are few changes in the quality of tape, and nearly all brands are essentially the same in response range, distortion and noise characteristics, and output level. Since a particular brand may give better results on one recorder than another, it may be desirable to use the tape recommended by the maker of your recorder.

High-grade recorder (over $400)

The following high-quality tape recorder would be suitable for top-quality high-fidelity reproduction in conjunction with a correspondingly high-quality speaker system.

A. RECOMMENDED

Ampex, Model 601 (Ampex Electric Co., Redwood City, Calif.) $595. Power amplifier and speaker, $170 extra. **AA3**

Ordinary-grade recorders (under $300)

Recorders in this price class are not to be considered for inclusion in a good high-fidelity system. However, with a good-quality external speaker system, some will provide reproduction comparable to that obtainable from one of the better record players now available (see page 174). The first price given in the listings is the list price; the second and lower price is that at which recorders could be purchased in some outlets at the time of test. Ratings are cr58.

A. RECOMMENDED

Bell & Howell, Model 775G (Bell & Howell Co., 7100 McCormick Rd., Chicago 45) $199.95; $149. A very satisfactory recorder, but could not be used with an external amplifier.

Norelco Continental, Model EL3516 (North American Phillips Co., Inc., 230 Duffy Ave., Hicksville, L. I., N.Y.) $269.50. Judged an excellent recorder, overall, and the only recorder of the ones tested which provided an extra tape speed of 1⅞ in. per second. Could be used with an external amplifier.

VM, Model 714 (VM Corp., Benton Harbor, Mich.) $225; $160. This model recorded and erased monaurally but included provision for playing stereo tape with either "stacked" or "staggered" heads (simple switch control). Two preamplifiers included, but the user would need a separate amplifier and speaker system. An excellent recorder, overall. Could be used with an external amplifier.

Wollensak, Model T-1500 (Wollensak Optical Co., 320 E. 21 St., Chicago 16) $199.50; $140. This recorder was the most compact and lightest of all those tested, and was very satisfactory in all respects. Could be used with an external amplifier.

B. INTERMEDIATE

Ampro, Model 758 (Graflex Inc., Rochester 3, N. Y.) $249.95; $150. Well designed and very satisfactory, overall. Leakage current (0.8 ma.) was objectionably high. The recorder would otherwise have received an *A-Recommended* rating.

Bell, Model BT-2051B (Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio) $224.50. This model recorded and erased monaurally but included stacked heads and two preamplifiers which provided stereophonic playback if used with an additional amplifier and speaker. A very satisfactory recorder and the only one tested employing three motors. Braking was poor, otherwise would be worthy of an *A-Recommended* rating.

Pentron, Model NL-3 (Pentron Corp., 777 S. Tripp Ave., Chicago 24) $189.95. Judged a very satisfactory recorder with several desirable features. The single-knob control which combines play, record, rewind, and fast-forward functions was judged somewhat difficult to operate as compared with the key-type controls present on several other makes.

RCA, Model 8-TR-2 (Radio Corp. of America, RCA Victor and "Victrola" Div., Camden 8, N. J.) $179.95. Lacked some of the features which many users would desire in a tape recorder. Leakage current (0.8 ma.) was objectionably high.

Revere, Model T-1100 (Revere Camera Co., 320 E. 21 St., Chicago 16) $169.50; $118. This recorder has the advantages of neat appearance and compact design. However, it had relatively poor speed regulation.

Wilcox Gay, Model 772 (Wilcox-Gay Corp., Charlotte, Mich.) $230; $130. The *Wilcox Gay* was the only recorder which employed permanent-magnet erase, which is judged less desirable than the electromagnetic erase.

C. NOT RECOMMENDED

Silvertone, Model 8074 (Sears-Roebuck's Cat. No. 57—08074) $149.95, plus postage; $130. Excessive shock hazard; leakage current, 1.6 ma.

▶ **REF:** Bulletin, Apr. '58.+++

Portable battery-operated recorders

These machines are suitable only for recording of speech and recommended only for use in circumstances that call for a lightweight, compact recording device.

A. RECOMMENDED

Midgetape (Mohawk Business Machines Corp., 944 Halsey, Brooklyn 33, N.Y.) $250; accessories, extra. For battery or a-c operation. Useful mainly as a portable instrument (readily transported; very light weight).

▶ **REF:** Bulletin, Aug. '55.+++

Pocket-size wire recorder

A. RECOMMENDED

Minifon P-55-S (Made in West Germany; distributed by Geiss-America, 6424 N. Western Ave., Chicago 45)

$289.50, including 20-min. recording wire, direct playback microphone, one set of batteries. A well-made machine; judged very convenient in spite of its small size.

▶ **REF:** Bulletin, May '58.++++

BASIC LIBRARY OF LP RECORDS

The purpose of this list is to guide the newcomer a short way down major musical paths so that before long he will know which ones he wishes to explore fully.

The problem was approached this way: What are judged to be basic masterpieces that have stood the test of time? Who performs them well and is satisfactorily recorded by today's standards? In the event the running is close and there is an "overside" selection that may sway the choice, which selection best fits the purpose of the record library?

To save space, only the basic selection is listed. Records listed are to be played at 33⅓ revolutions per minute. All are monaural.

ORCHESTRAL

Bach: *Brandenburg Concerto No. 2.* Vienna State Opera Orchestra under Prohaska. Bach 540. $4.98.

Bartok: *Concerto for Orchestra.* Chicago Symphony under Reiner. RCA Victor LM 1934. $4.98.

Beethoven: *Leonore Overtures 1, 2, 3, Fidelio Overture,* and *Coriolan Overture.* Boston Symphony under Munch. RCA Victor LM 2015. $4.98.

Beethoven: *Symphony No. 3.* Chicago Symphony under Reiner. RCA Victor LM 1899. $4.98.

Beethoven: *Symphony No. 5.* Philharmonic Symphony of London under Rodzinski. Westminster W-Lab. 7058. $7.50.

Beethoven: *Symphony No. 7.* Chicago Symphony under Reiner. RCA Victor LM 1991. $4.98.

Brahms: *Variations on a Theme by Haydn.* NBC Symphony under Toscanini. RCA Victor LM 1725. $4.98.

Brahms: *Symphony No. 4.* NBC Symphony under Toscanini. RCA Victor LM 1713. $4.98.

Debussy: *Prélude a l'apres-midi d'un faune.* Orchestre de la Suisse Romande under Ansermet. London LL 1552. $3.98.

Dvorak: *Slavonic Dances* (Op. 46 and 72). Cleveland Orchestra under Szell. 4 sides. Epic SC 6015. $7.96.

Dvorak: *Symphony No. 5.* NBC Symphony under Toscanini. RCA Victor LM 1778. $4.98.

Franck: *Symphony.* Bamberg Symphony under Lehmann. Decca DL 9887. $3.98.

Handel: *Water Music.* Berlin Philharmonic under Lehmann. Decca DL 9594. $3.98.

Haydn: *Symphony No. 104.* Cleveland Orchestra under Szell. Epic LC 3196. $3.98.

Liszt: *Les Préludes.* Boston Symphony under Monteux. RCA Victor LM 1775. $4.98.

Mendelssohn: *Symphony No. 4.* Concertgebouw Orchestra under Van Beinum. Epic LC 3411. $3.98.

Mozart: *Symphony No. 40.* Royal Philharmonic under Beecham. Columbia ML 5194. $3.98.

Mussorgsky: *Pictures at an Exhibition.* NBC Symphony under Toscanini. RCA Victor LM 1838. $4.98.

Prokofiev: *Classical Symphony.* Philharmonia Orchestra under Markevitch. Angel 35008. $4.98.

Rimsky-Korsakoff: *Russian Easter Overture.* London Symphony under Scherchen. Westminster 7043. $7.50.

Rossini: *Overtures.* Minneapolis Symphony under Dorati. Mercury MG 50139. $4.98.

Schubert: *Symphony No. 8.* Philadelphia Orchestra under Ormandy. Columbia ML 5221. $3.98.

Schubert: *Symphony No. 9* (No. 7). Berlin Philharmonia under Furtwängler. Decca DX 119. $3.98.

Sibelius: *Symphony No. 2.* Philadelphia Orchestra under Ormandy. Columbia ML 5207. $3.98.

Strauss, J.: *Die Fledermaus, Excerpts.* Vienna Philharmonic under Krauss. London 5023. $4.98.

Strauss, R.: *Don Juan.* Vienna Philharmonic under Krauss. London LL 233. $3.98.

Stravinsky: *Firebird Suite.* Stokowski and His Orchestra. RCA Victor LM 9029. $4.98.

Stravinsky: *Petrouchka.* Orchestre de la Suisse Romande under Ansermet. London LL 130. $3.98.

Tchaikovsky: *Nutcracker Suite.* Royal Philharmonic under Beecham. Columbia ML 5171. $3.98.

Tchaikovsky: *Romeo and Juliet.* Amsterdam Concertgebouw under Van Kempen. Epic 3LC 3008. $3.98.

Tchaikovsky: *Symphony No. 6.* Philadelphia Orchestra under Ormandy. Columbia ML 4544. $3.98.

Vaughan Williams: *Fantasia on a Theme by Thomas Tallis.* New Symphony Orchestra under Collins. London LL 583. $3.98.

Weber: *Overtures.* Vienna Philharmonic under Böhm. London LL 354. $3.98.

CONCERTI

Bach: *Violin Concerto No. 2.* Oistrakh with the Philadelphia Orchestra. Columbia ML 5087. $3.98.

Beethoven: *Piano Concerto No. 4.* Rubinstein with the Symphony of the Air. RCA Victor LM 2123. $4.98.

Beethoven: *Piano Concerto No. 5.* Backhaus with the Vienna Philharmonic. London LL 879. $3.98.

Beethoven: *Violin Concerto.* Milstein with the Pittsburgh Symphony. Capitol P 8313. $4.98.

Brahms: *Violin Concerto.* Milstein with the Pittsburgh Symphony. Capitol P 8271. $4.98.

Chopin: *Piano Concerto No. 1.* Sandor with the Philadelphia Orchestra. Columbia ML 4651. $3.98.

Grieg: *Piano Concerto.* Novaes with the Pro Musica Symphony. Vox 8520. $4.95.

Mendelssohn: *Violin Concerto.* Milstein with the Pittsburgh Symphony. Capitol P 8243. $4.98.

Mozart: *Piano Concerto No. 25.* Gieseking with the Philharmonia Orchestra. Angel 35215. $4.98.

Mozart: *Violin Concerto No. 5.* Heifetz with the London Symphony. RCA Victor LM 9014. $4.98.

Rachmaninoff: *Piano Concerto No. 2.* De Groot with the Hague Philharmonic. Epic 3LC 3009. $3.98.

Schumann: *Piano Concerto.* Novaes with the Pro Musica Symphony, Vienna. Vox PL 8540. $4.98.

Tchaikovsky: *Violin Concerto.* Oistrakh with the Saxon State Orchestra. Decca 9755. $3.98.

CHAMBER

Beethoven: *Piano Trio No. 7* (Op. 97). Fournier, Janigro, Badura-Skoda. Westminster 18270. $4.98.

Beethoven: *Sonata for Violin and Piano No. 9.* Fuchs and Balsam. Decca 9640. $3.98.

Beethoven: *Quartet No. 7* (Op. 59, No. 1). Budapest Quartet. Columbia ML 4579. $3.98.

Beethoven: *Quartet No. 10* (Op. 74). Budapest Quartet. Columbia ML 4582. $3.98.

Brahms: *Sonata for Violin* (Op. 108). Stern, Zakin, Columbia ML 4363. $3.98.

Debussy: *String Quartet.* Quartetto Italiano. Angel 35130. $3.98.

Dvorak: *Piano Quintet* (Op. 81). Curzon, Budapest Quartet. Columbia ML 4825. $3.98.

Franck: *Sonata for Violin, Piano.* Francescatti, Casadesus. Columbia ML 4178. $3.98.

Haydn: *String Quartet* (Op. 33, No. 3). Quartetto Italiano. Angel 35297. $4.98.

Mozart: *String Quintet* (K.516). Trampler, Budapest Quartet. Columbia ML 5192. $3.98.

Mozart: *Clarinet Quintet* (K.581). Kell, Fine Arts Quartet. Decca 9600. $3.98.

Mozart: *String Quartet No. 18* (K.464). Budapest Quartet. Columbia ML 4728. $3.98.

Schubert: *Trio No. 1* (Op. 99). Fournier, Janigro, Badura-Skoda. Westminster 18481. $4.98.

Schubert: *String Quartet No. 13* (Op. 29). Budapest Quartet. Columbia ML 4831. $3.98.

Schumann: *Quintet for Piano and Strings* (Op. 44). Curzon, Budapest Quartet. Columbia ML 4426. $3.98.

KEYBOARD

Bach: *Complete Organ Works,* Vol. IV. Weinrich (organ). Westminster XWN 18260. $4.98.

Bach: *Well Tempered Clavier,* No. 1-8. Landowska (harpsichord). RCA Victor LM 1017. $4.98.

Beethoven: *Sonata for Piano No. 14.* Horowitz (piano). RCA Victor LM 2009. $4.98.

Chopin: *Études,* Op. 25. Novaes (piano). Vox PL 7560. $4.98.

Chopin: *Sonata No. 2.* Novaes (piano). Vox PL 7360. $4.98.

Liszt: *Sonata.* Barère (piano). Remington 85. $3.98.

Scarlatti: *Sonatas for Harpsichord.* Valenti. Westminster 18461. $4.98.

Schumann: *Carnaval.* Novaes (piano). Vox PL 7830. $4.98.

OPERA

Bizet: *Carmen.* Stevens, Peerce, under Reiner. 6 sides, RCA Victor LM 6102. $14.94.

Gluck: *Orfeo ed Euridice.* Stevens, della Casa, Peters, under Monteux. 6 sides, RCA Victor LM 6136. $14.94.

Mozart: *Don Giovanni.* Siepi, Corena, Dermota, Danco, etc., under Krips. 8 sides, London A 4406. $19.92.

Mozart: *Le Nozze di Figaro.* Siepi, Poel, Casa, Gueden, etc., under Kleiber. 8 sides, London A 4407. $19.92.

Puccini: *La Bohème.* Albanese, Peerce, under Toscanini. 4 sides, RCA Victor LM 6006. $9.96.

Purcell: *Dido and Aeneas.* Flagstad, Mermaid Theatre Group. RCA Victor LM 2019. $4.98.

Rossini: *Il Barbiere di Siviglia.* Becchi, de Los Angeles under Serafin. 6 sides, RCA Victor LM 6104. $14.94.

Verdi: *Aïda.* Tebaldi, del Monaco, under Erede. 6 sides, London 4308. $14.94.

Verdi: *Otello.* Vinay, Nelli, under Toscanini. 6 sides, RCA Victor LM 6107. $14.94.

Wagner: *Die Walkuere Act III.* Flagstad, Edelman, Svanholm with the Vienna Philharmonic under Solti. 4 sides, London A 4225. $9.96.

VOCAL

Bach: *Mass in B Minor.* Von Karajan, Soloists, Chorus, Philharmonia Orchestra. 6 sides, Angel 3500 C. $14.94.

Bach: *St. Matthew Passion.* Scherchen, Soloists, Chorus. 8 sides, Westminster 4402. $15.92.

Beethoven: *Missa Solemnis.* Toscanini, Shaw Chorale, NBC Symphony. 4 sides, RCA Victor LM 6013. $9.96.

Debussy: *Trois Ballades,* etc. Micheau. Epic LC 3355. $3.98.

Fauré: *Requiem.* Danco, Souzay, Ansermet. London 5221. $4.98.

Handel: *Messiah.* Boult, London Philharmonia Choir. 8 sides, London A 4403. $19.92.

Maria Kurenko. Mussorgsky, Prokofiev, **Gretchaninoff.** Capitol P 8310. $4.98.

Schubert: *Die Winterreise.* Fischer-Dieskau. 4 sides, RCA Victor LM 6036. $9.96.

Schumann: *19 Songs.* Fischer-Dieskau. Decca DL 9935. $3.98.

Verdi: *Requiem.* Toscanini, Shaw, NBC Symphony. 4 sides, RCA Victor LM 6018. $9.96.

Heating and fuels

SELECTION OF A HEATING SYSTEM

The heating plant is one of the most expensive elements that enters into the equipment of a house. Anyone planning to build a new home or having occasion to replace a heating system in an existing home will find it well worth while to give serious study to the choice of the type of heating system and to choose one that is best suited to the home owner's needs and to the type of fuel available and economical in his community.

Split-level homes are poorly adapted to warm-air heating unless the system is carefully designed—as it seldom is. A heating system that provides high heat-storage capacity and low velocity of air circulation — for example, hot water with ordinary radiators, baseboard heating, or floor-panel heating—is best suited to split-level homes.

The first floors of basementless homes are likely to be cold and drafty at the floor level unless the right type of radiation is chosen. Baseboard or floor-panel heating is well suited to the home without a basement.

Picture windows may often introduce serious heating problems. To minimize drafts and uneven heating where there is a big area of cold glass, baseboard radiation or the types of steam and hot water that use convectors, with the use of heavy-duty (extra capacity) convector units under the glass areas, should be chosen in preference to radiator or floor-panel heating or warm air.

A steam system, is relatively inexpensive and simple to install. It delivers heat fast to the rooms, but, largely for this reason, calls for careful control to prevent overheating for short periods and to maintain temperatures at reasonably uniform levels. One advantage of steam is that radiators need to be only two thirds as big as hot-water radiators; and steam, too, is well suited to heating the domestic hot-water supply. It is readily adapted to "zoned" or sectional temperature control and to large and even rambling buildings. On the other hand, steam systems, unless carefully designed and assembled, are often somewhat noisy at times.

Gravity hot-water systems are relatively quiet but are slow in response to demands for heat. Gravity hot-water systems, unless used with an oil burner or stoker, are usually not dependent upon electricity supply and should be considered wherever power system conditions are such that one may expect current interruptions of several hours or longer during severe winter weather.

The forced-flow system is necessary if domestic hot water is to be obtained from the main heater. Forced-flow hot water is the preferred system for radiant and baseboard types of radiation, which use small pipes.

Note: both steam and hot-water systems require special attention in case cessation of power or fuel supply requires that the system be shut down for a time during very cold weather, as both are subject to freeze-up in case they are not kept fired. A freeze-up could be disastrous to a boiler, and with a hot-water system, also to pipes and radiators.

The large stored-heat content of a hot-water system assures relatively steady heat, and a good degree of temperature stability. While installation costs are greater for hot-water systems than for warm air, the former will likely require somewhat less fuel for operation.

Gravity warm-air is the most economical of all heating systems to install and is well suited for the small, compact, modern home of almost square design, with a basement.

The forced warm-air and gravity hot-water systems are next in economy of installation. Although, like gravity warm air, the forced warm-air system is limited to control by one thermostat, it is somewhat more flexible, and is better adapted to long or irregularly-shaped houses. Both types of warm-air heating are quick in response to temperature changes. Warm-air systems tend to circulate dust (filters are expensive), give somewhat spotty or changeable heat

TYPES OF HEATING SYSTEMS—SUPPLEMENTARY INFORMATION

Kind of system	Type of radiation	Kind of house for which suited	Advantages	Disadvantages
Steam One-pipe	Radiators, convectors	Houses with basements.	Rapid response to demands for heat, and therefore popular in very cold climates.	The installation, if not properly designed and carried out, can result in objectionable "water hammer."
Two-pipe	Radiators, convectors, baseboard units	Can be installed in basementless homes if an electric pump is used to return condensate to boiler.	Two-pipe systems are somewhat more expensive but are preferable to one-pipe systems.	Good temperature control is more difficult than with hot-water systems and spaces heated are usually subject to rather large fluctuations in temperature. This applies also to one-pipe systems.
Two-pipe*	Steam-driven fan heat-transfer units	Any type.	Permits individual control of heating for each room.	Somewhat higher price than regular baseboard heating.
Hot Water Gravity circulation	Radiators, convectors	Best suited for compact houses with basements.	Economical to install. Independent of electric current supply unless the boiler is electrically controlled or fired.	Requires oversize piping. Response to sudden demands for heat is slow. A separate means for heating domestic hot water is necessary with this system.
Forced circulation	Radiators, convectors, baseboard units, panel heating	Any type.	Gives more uniform temperature in all radiators than gravity circulation. Its response to heat requirements is rapid; it can be used to heat domestic hot water.	Operation depends upon continuity of electrical supply but the system can, if properly equipped and fired by gas or coal, be operated to some extent with the electrical power off.
Warm air Gravity circulation	Registers	Compact, nearly square houses with basements.	Low first cost.	Air filters cannot be used as they would too greatly restrict the flow of air. Difficult to heat rooms exposed to strong wind. A separate means for heating domestic hot water is necessary with this system.
Forced circulation, perimeter	Ducts or pipes under floor	One story basementless house with concrete floors.	Eliminates cold floors. Rapid response to demands for heat.	Requires well-designed floor slab. Difficult to adjust for heat demand in different rooms.

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* This type of system is offered by Iron Fireman under the name *Selectemp*.

distribution, and room temperatures may change rapidly at times. Forced warm-air systems may produce fan noise to an undesirable extent in some parts of the house.

DOMESTIC HEATING EQUIPMENT

Oil burners and boilers

If you are planning to change from heating by coal to heating by oil you can purchase either a conversion burner to be used with your existing furnace or boiler, or a complete "integrated unit." With few exceptions, so-called integral units are merely the manufacturers' combination of standard conversion burners with equally standard boilers or furnaces. If you have a boiler or furnace in good working condition, that is watertight or airtight, reasonably free from scale or rust, and of good design, there is little or nothing to be gained by abandoning it and losing its value by replacing it with a new combined unit.

Cast iron versus steel boilers

The question of cast iron vs. steel for boiler construction is highly controversial. Cast iron breaks more readily by strains or corrosion in joints; on the other hand, it resists the action of rust far better than steel. In the early days of the oil burner, sudden expansion and contraction due to flame impingement cracked many cast-iron boilers; today, with modern refractory furnace linings, this is very unlikely to be a problem with oil-fired boilers (*provided* the boiler is one that gives satisfactory efficiency in the use of fuel through the presence of a sufficient number of intermediate sections).

Regardless of age, a cast-iron boiler in good condition (particularly in the joints between the sections) can be expected to give many additional years of reliable and efficient service with a properly installed burner and a well-built refractory furnace lining. Even boilers that are somewhat lacking in intermediate heating surface can be brought up to good efficiency through the addition of an overfire baffle at moderate cost.

Many salesmen will recommend replacement of a cast-iron boiler with a "modern steel boiler." This will be followed by recommendations of a "summer-winter hookup" for domestic hot-water supply, and, if the system is gravity hot water, by advice to convert the system to forced circulation through changes in piping and the addition of an electric circulating pump. While all of this may make a fine installation for a new home, and may even be in order for a conversion job, it is very bad advice for anyone wishing to keep heating plant costs down, and the new system *may* turn out to be no better than the old one. Such representations as a rule will simply reflect the salesman's wish to make more profit on the deal.

Summer-winter hot-water hookups

Running the oil burner at a low rate during the summer to provide the domestic hot-water supply has the advantage that it will minimize the formation of rust and corrosion on boiler surfaces.

Actually, if the present installation has a gas or electric water heater that is working satisfactorily and the heating system must be replaced, it would seem better to choose a cast-iron boiler than to give up the good domestic hot-water service unit and equip the new heating plant with a summer-winter hookup. Do not expect the summer-winter system to be particularly economical; hot water requires the expenditure of fuel even if the hot water comes from an auxiliary to the heating boiler. Further, in small homes, particularly, there often just isn't enough heat storage capacity in the water in the boiler to supply the quantity of hot water for bathing, laundering, etc., which modern living has come to require.

Domestic oil burners

Four types of oil burners are available for domestic use:

1. High-pressure atomizing gun burners, which are the most popular (about 84 percent of sales).
2. Low-pressure atomizing burners (about 10 percent).
3. Vertical rotary burners (5 percent of sales).
4. Vaporizing or pot-type burners (1 percent of sales).

High-pressure gun burners

As high-pressure burners are almost all completely assembled from component standard parts, there is often very little difference in quality and performance between different brands. A thorough inquiry into the local dealer and his promptness, reliability, and reasonable charges in servicing will often be by far the most important element in the selection of a brand of oil burner.

In a high-pressure burner, the oil is forced through a very small orifice. In small burners which consume less than one gallon of oil per hour, the orifice is so small that the slightest impurities in the oil, or corrosion of the nozzle, may very likely cause a blockage of the nozzle with a resultant shut down, even with the risk of setting the house on fire. For this reason, high-pressure burners using less than one gallon per hour are not recommended. For low rates of oil consumption, low-pressure or vertical rotary burners, which do not use small orifices, are to be preferred.

A. RECOMMENDED

Carlin (The Carlin Co., Wethersfield 9, Conn.) *Model 400 S-2,* 0.75* to 1.75 g.p.h.; *Model 400 S-3,* 1.75 to 3.0 g.p.h.

Chrysler Airtemp (Airtemp Div., Chrysler Corp., Dayton 1, Ohio) See listing of *Wayne.*

Esso (Esso Standard Oil Co., 15 W. 51 St., N.Y.C.) *Model CS,* 1.2 to 1.65 g.p.h. and 1.75 to 2.5 g.p.h.

Gilbarco (Gilbert & Barker Mfg. Co., West Springfield, Mass.) *Model CS,* same as *Esso.*

Heil (Heil-Quaker Corp., Milwaukee 1) *Model CB-1,* 0.65* to 1.65 g.p.h. *Model CB-2,* 0.75* to 2.5 g.p.h.

Sun-Ray (Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 35, N.Y.) Series S. Uses *Shell* head and delayed-action oil valve (both desirable).

Sunstrand (Sunstrand Engineering Co., Rockford, Ill.) *Model SS,* 0.5* to 2.25 g.p.h., delayed-action oil valve. *Model XA-2,* 0.75* to 1.75 g.p.h., and *Model XB-4,* 1.35 to 3.0 g.p.h., delayed-action solenoids; *Shell* heads optional, at extra cost.

Wayne (Wayne Home Equipment Co., Fort Wayne, Ind.) Sold to heating equipment manufacturers, such as Chrysler, York, and others, for sale under their private brand names. *Model E,* 0.6 to 3.0 g.p.h.

B. INTERMEDIATE

ABC (Automatic Burner Corp., Chicago) Also sold to heating equipment manufacturers for resale under their own brand names. *Model 55-J,* 0.6* to 3.0 g.p.h. *Model 52-A,* 1.0 to 5.5 g.p.h.

Beckett (R. W. Beckett Corp., Elyria, Ohio) Also sold to heating equipment manufacturers for resale under their own brand names. *Series OC,* 0.75* to 2.0 g.p.h. *Series ON,* 1.65 to 3.50 g.p.h.

Delco (Delco Appliance, Div. General Motors Corp., Rochester 1, N.Y.) *Model H-200,* 0.75* to 1.75 g.p.h. *Model H-300,* 1.5 to 2.75 g.p.h. *Series F165-1,* 0.75* to 1.65 g.p.h. *Series F175-1,* 1.50 to 2.75 g.p.h. Furnace and boiler-burner units have stainless-steel combustion chambers which are considered less desirable than fire brick.

Esso (Esso Standard Oil Co.) *Model BS.* Same as *Model CS,* except that *Model BS* does not have the desirable economy clutch.

Gilbarco (Gilbert & Barker Mfg. Co.) *Model BS.* Same as *Esso Model BS.*

Iron Fireman (Iron Fireman Mfg. Co., Cleveland 11) *Model M-2,* 0.6* to 4.5 g.p.h. *Model V, Radiant Vortex,* up to 2.5 g.p.h.

Nu Way (Nu-Way Corp., Rock Island, Ill.) *Model 1XL,* 0.65* to 1.75 g.p.h. *Model 1XL 300,* 1.75 to 3.00 g.p.h.

Radiant (Radiant Utilities Corp., Brooklyn 14, N.Y.) *Model S & A,* 0.75* to 2.0 g.p.h.; *Model 2½ M,* 1.35 to 2.5 g.p.h.; *Model 2,* 0.75* to 1.75 g.p.h.; *Model 3,* 1.75 to 3.0 g.p.h.; *Models 2* and *3,* when equipped with *Shell* heads at extra cost are rated *B+*.

Timken (Silent Automatic Products, Cleveland 11)

Toridheet (Toridheet Div., Cleveland Steel Products Co., Cleveland 11) *Model JC,* 0.5* to 2.75 g.p.h.

C. NOT RECOMMENDED

Radiant (Radiant Utilities Corp.) *Model I,* 0.50 to 0.75 g.p.h. Capacity too small for gun-type burner; see text.

Low-pressure oil burners

These burners, which permit firing rates as low as 4/10 gallon per hour, are particularly suitable for present-day well-insulated small homes. Low-pressure burners are more complicated than the high-pressure types and are therefore higher priced (about 15 percent higher), but much of their extra cost will ultimately be returned to the consumer in the form of better performance and lower operating and service charges.

A. RECOMMENDED

Williams Oil-o-matic (Eureka-Williams Corp., Bloomington, Ill.) *Model R-160,* 0.4 to 1.6 g.p.h. *Model Fifty-Ten,* 0.6 to 3 g.p.h.

Winkler (Stewart Warner Corp., Lebanon, Ind.) *Model L-2,* 0.5 to 1.50 g.p.h. *Model L-3,* 1.5 to 2.75 g.p.h.

General Electric Combination Furnace-Burner Units (General Electric, Bloomfield, N.J.) Manufacture of boiler-burner units has been discontinued, but some are still available from distributors.

Vertical rotary burners

These are particularly adapted for use in small residences, especially when used for the conversion of round or square (but not rectangular) hand-fired boilers or furnaces. They are also used effectively in complete boiler-burner and furnace-burner units. Usually the only moving part in these burners is the rotor, which is a combination fan and oil distributor. Vertical rotary burners are quiet in operation and will operate satisfactorily with oil-burning rates as low as 0.35 gallons per hour. Costs installed are about 35 percent higher than for high-pressure gun-type burners.

A. RECOMMENDED

Iron Fireman (Timken Silent Automatic Div., Iron Fireman Mfg. Co.) Same as *Timken;* see below.

Timken Silent Automatic (Silent Automatic Products) *Model OCA-10,* 0.35 to 1.4 g.p.h. *Model OCA-18,* up to 2.5 g.p.h.

Toridheet (Cleveland Steel Products Corp., Cleveland 11) *Model F,* 0.5 to 1.5 g.p.h. *Model F-2,* 0.5 to 2.5 g.p.h. *Model C,* 2.5 to 6 g.p.h.

Vaporizing pot-type burners

These non-mechanical gravity-fed burners are used only for very small installations. They use No. 1 fuel oil or kerosene and are hazardous if not kept clean. CB indicates conversion burner; FB, furnace-burner combination.

B. INTERMEDIATE

The following vaporizing pot-type oil burners for central house heating use are listed *B. Intermediate* on general considerations (see above) rather than any inherent faults of individual burners.

Breese (Boston Machine Works Co., Lynn, Mass.) CB

Century (Century Engineering Corp.) CB, FB

Little (H. C. Little Burner Co., Inc., San Rafael, Calif.) CB, FB

Quincy (Quincy Stove Mfg. Co., Quincy, Ill.) CB

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* CR does not recommend equipping high-pressure burners with nozzles for flows of less than 1.0 gallon per hour.

C. NOT RECOMMENDED

Vaporizing pot-type burners equipped to burn *more* than 1 gal. per hr.

Gas-fired conversion burners and combination units

It is recommended that persons who have a gas heating furnace should allow the pilot light to burn through the summer. The heat from even this small flame helps to keep the equipment dry and to protect it from corrosion.

The following key letters indicate the types available from the several manufacturers:

CB—Conversion Burner without boilers or furnaces
BB—Boiler-Burner combinations for hot-water or steam systems
FB—Furnace-Burner combinations for warm air

A. RECOMMENDED

Arrow (Dowagiac Steel Furnace Co., Dowagiac, Mich.) FB

Basmor (Bastian-Morley Co., Inc.; distributed by Crane Co., Chicago) BB

Bryant (Bryant Mfg. Co., Indianapolis) FB, BB

Carrier (Carrier Corp., Syracuse) FB

Century (Century Engineering Corp., Cedar Rapids, Iowa) FB

Chrysler (Airtemp Div., Chrysler Corp.) FB

Climatrol (Mueller Climatrol, Milwaukee) FB

Crane (Crane Co., Chicago 5) BB

General Electric (General Electric Co., Bloomfield, N.J.) FB

Heat Pak (Aldrich Co., Wyoming, Ill.) BB

Heil (Heil Co., Milwaukee 1) FB, BB

Hydrotherm (Hydrotherm, Northvale, N.J.) BB

Iron Fireman (Iron Fireman Mfg. Co., Cleveland 11) FB, BB

Kalamazoo (Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.) FB

Mor-Sun (Morrison Steel Products Co., Buffalo) FB

Niagara (Niagara Furnace Div., Forest Cities Foundries Co., Cleveland) FB

Oneida (Oneida Heater Co., Oneida, N.Y.) FB

Peerless (Peerless Heater Div., Eastern Foundry Co., Boyertown, Pa.) BB

Pennco (Pennsylvania Furnace & Iron Co., Warren, Pa.) BB

Richmond (Richmond Radiator Co., New Castle, Del.) BB, FB

Thatcher (Thatcher Furnace Co., Garwood, N. J.) FB, BB

Timken (Silent Automatic Products) FB, BB

Toridheet (Toridheet Div., Cleveland Steel Products Corp., Cleveland) FB

Utility (Utility Appliance Corp., Los Angeles) FB

Waterman-Waterbury (Waterman-Waterbury Co., Minneapolis) FB

Williams (Eureka Williams Corp., Bloomington, Ill.) FB, BB

Winkler (Stewart-Warner Corp., Lebanon, Ind.) FB, BB

B+

Because the greater desirability of a coordinated unit warrants a distinction over conversion equipment, the highest rating given a conversion gas burner is *B+*.

Arrow (Dowagiac Steel Furnace Co.) CB

Bryant (Bryant Mfg. Co.) CB

Century (Century Engineering Corp.) CB

Certified (Certified Furnace Div., Stainless & Steel Products Co., St. Paul) CB

Climatrol (Mueller Climatrol) CB

Handley-Brown (Handley-Brown Heater Co., Jackson, Mich.) Designed for installation in the fire door. CB

Heil (Heil Co.) CB

Iron Fireman (Iron Fireman Mfg. Co.) CB

Permaglas (A. O. Smith, Kankakee, Ill.) CB

Roberts-Gordon (Roberts-Gordon Appliance Corp., 46 Central, Buffalo 6) CB

Timken (Silent Automatic Products) CB

Waterman-Waterbury (Waterman-Waterbury Co.) CB

Winkler (Stewart-Warner Corp.) CB

B. INTERMEDIATE

Lennox, "Glo-Ring" (Lennox Furnace Co., Marshalltown, Iowa, and Syracuse) CB

Pennsylvania (Pennsylvania Furnace & Iron Co.) CB

Upshot (The Adams Mfg. Co., Cleveland) CB

Gas-fired floor furnaces

A. RECOMMENDED

Coleman (Coleman Co., Wichita, Kans.) 24,000 and 35,000 Btu input.

Duo-Therm (Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.) G: 4 models to 42,000 Btu input.

Sunbeam Navaho (American Radiator Co., Pittsburgh) 3 models to 35,000 Btu input.

Gas-fired wall heating units

A. RECOMMENDED

Bryant Radiant Panel Heater (Affiliated Gas Equipment Inc., Cleveland)

Utility Wall Heater (Utility Appliance Corp., Los Angeles)

Automatic anthracite equipment

The greater convenience offered by oil- and gas-heating equipment has tended to diminish greatly the use of anthracite furnaces, and on that account automatic anthracite equipment comprising burner and stoker have come into only rather limited use. The following are regarded as satisfactory of their type.

A. RECOMMENDED

Anthratherm (Van Wert Stoker Mfg. Co., Peckville, Pa.) Integral boiler-burner unit.

Anthratube (Axeman-Anderson Co., Williamsport, Pa.) Integral boiler-burner unit.

Anthra-Flo (Coal-O-Matic Stoker Co., Trucksville, Pa.) Integral boiler-burner unit.

Electric Furnaceman (General Machine Co., Emmaus, Pa.) Conversion units and boiler-burner combinations.

Losch (Losch Boiler Co., Summit Station, Pa.) Boiler-burner combination. Can burn rice or the cheaper barley-size anthracite.

Motor-Stokor (Hershey Machine & Foundry Co., Manheim, Pa.) Conversion units and boiler-burner combinations.

Spencer (Spencer Heater Co., Williamsport, Pa.) Magazine-feed boiler.

HEATING WITH ELECTRICITY

Except for its high cost and possibility of the supply being cut off due to wind, ice, snow, and sleet storms, electricity would be the ideal method for heating homes. When used in well-insulated homes with separate temperature controls for each room and particularly in mild climates, electricity can be very attractive because of its cleanliness, freedom from need to handle fuel and ashes, extreme simplicity, and flexibility of operation. In considering expense of operation, estimate that, with electricity at 3 cents per kilowatt-hour, heating costs will be about six times as much as with fuel oil at 16 cents per gallon (at other rates for electricity, in proportion).

Safety precautions

Electric heaters should not be assumed to be safe just because no gases or open flames are involved, for temperatures of the heating elements are often high. All precautions should be taken to keep flammable materials away from hot parts and surfaces; to avoid tipping any portable heater; to provide wiring of adequate capacity, especially important where portable or radiant heaters are used; and to be sure that the Underwriters' Laboratories' label is on all appliances.

The heat pump

The heat pump is an electrical device (very similar in principle to the home refrigerator) that "pumps" heat into the house in winter and out of the house in the summer. In the spring and fall seasons, it reverses its action automatically to provide either heat or cooling as needed.

Though offered by several large manufacturers, the heat pump is not yet in mass production. Thus an installation may now cost from $2000 to $3500. The annual electricity or "fuel" cost should average only about one third of the amount with conventional (direct) electric heating, but electric heat will still be about twice as expensive as fuel oil. There are also potential savings in building construction through elimination of chimneys and space for fuel storage, but operation costs are still too high except where electricity is very cheap (about 1½ cents per kilowatt-hour or less) or in mild climates where a limited amount of heat is required in the winter. (In regions where the temperature falls below 35°F some additional heating is usually required.)

Partial list of manufacturers of electric house-heating equipment

The following key letters indicate types available from the several manufacturers:
B—baseboard; C—ceiling heater; F—furnace; CC—ceiling cable; W—wall heaters, built-in.

Berko Electric Mfg. Corp., Queens Village 28, N.Y. B, W

Can Arm Corp., Champlain, N.Y. B, W, C

Cavalier Corp., Chattanooga 2, Tenn. B, W, F

Ceil Heat Inc., Knoxville, Tenn. W, CC

Continental Radiant Glass Heating Corp., New York 16. B, W

Crystalheat Co., Van Nuys, Calif. B, W

Edward L. Wiegand Co., Pittsburgh 8. B, W, CC, F

Electromode Corp., Rochester 3, N.Y. B, W, CC

General Electric Co., Providence 7, R.I. B, CC

Heatmore Inc., Brooklyn 6, N.Y. B, W, C

L. N. Roberson Co., Seattle 55, Wash. B, CC

Thermador Electric Mfg. Co., Los Angeles 22. B, W

U. S. Rubber Co., N.Y.C. Rubber panels of this type *(Uskon)* in use on a ceiling at Consumers' Research have not performed satisfactorily. The panels developed an unsatisfactory appearance due to buckling and finally as a result of the buckling a short circuit developed, followed by a fire.

Vulcan Radiator Co., Hartford 6, Conn. B

Wesix Electric Heater Co., San Francisco 5. B, W, CC, F

Westinghouse Electric Corp., Sunnyvale, Calif. B, W

Heat pumps

Acme Industries, Inc., 600 N. Mechanic, Jackson, Mich.

Brunner Mfg. Co., 1821 Broad, Newark 5, N.J.

Carrier Corp., Syracuse, N.Y.

General Electric Co., 5 Lawrence, Bloomfield, N.J.

Muncie Gear Works, Inc., Muncie, Ind.

Typhoon Prop-R-Temp Corp., 106 E. Buffalo Ave., Tampa 3, Fla.

Westinghouse Electric Co., Staunton, Va.

York Corp., York, Pa.

Portable electric heaters, fan type

B. INTERMEDIATE

Fan-Glo, Heetaire, Cat. No. L197-KT (LaSalle Products, Inc., Buffalo, affiliate of Markel Electric Products, Inc.) $25. A fairly good heater with several desirable and some disadvantageous features. 1360 watts. Thermostatic control.

General Electric, Cat. No. F41H1 (General Electric Co., Bridgeport, Conn.) $18. A good heater, satisfactory in most respects. 1380 watts. Thermostatic control. One end of heater coil not wholly shielded by guard to prevent possible shock hazard; would otherwise be *A. Recommended.*

Arvin, Model 5516 (Arvin Industries, Inc., Columbus, Ind.) $17. A fairly good heater, but somwhat less desirable than others in the *B* group, especially in features contributing to maximum safety in use. 1220 watts. Thermostatic control.

C. NOT RECOMMENDED

Arvin, Model 91A-1 (Arvin Industries, Inc.) $10.50.

Fresh'nd-Aire, Model H-553 (Fresh'nd-Aire Co., Div. Cory Corp., Chicago) $19.

Titan, Model 707 (Titan Mfg. Co., Buffalo) $19.

Portable radiant heater (without fan)

C. NOT RECOMMENDED

Handyhot, Cat. No. 1210 (Chicago Electric Div., Silex Co., Chicago 38) $8.

▶ **REF:** Bulletin, Mar. '56.

TYPES OF DOMESTIC RADIATION

"Radiant" panels

The complete absence of any visible radiators or convectors is a convenient and space-saving feature of panel heating or "radiant" systems which have heating coils in the floors, walls, or ceilings. Convection currents in the air are held to a minimum owing to the low temperature of the water in the system. The design should provide that surface temperatures of heated floors do not exceed 75 degrees. The very best of materials and workmanship, with careful inspection and testing before piping is covered, must be employed because of the obvious difficulty and expense of repairing any leaks that may develop. Rapid changes in outdoor temperature are not easily taken care of, because the heating or cooling of large masses of the floor and walls of the structure necessarily involves a lag between heat demand and the time the system catches up. It is difficult to provide extra heat in exposed areas, as at picture windows.

Baseboard radiation

Forced hot-water systems with baseboard radiation are more efficient than the old gravity systems with radiators, and more adaptable to zone control. Relatively low in first cost, installations are simple, pleasing, and non-obtrusive in appearance. Baseboard radiation is most efficient and effective when mounted around the periphery of rooms rather than along inside partitions; since the distance along the periphery is limited, baseboard systems are best adapted to climates having less than 4000 degree-days of heat demand per winter (ask nearest Weather Bureau office), although special high-capacity models can be used up to 8000 degree-days. Above 8000, it is best to use standing radiation. Units must be carefully sealed at junctions with the walls to avoid streaking of walls. With this type of heat, it is sometimes a problem to find adequate space for radiation in kitchens. Where extra heat is needed, it can be provided by partial use of radiators or convectors.

The following key letters indicate the types available:

R—Cast-iron radiant type. *(A. Recommended* only for mild climates where the annual demand for heat is moderate and does not exceed 4000 degree-days.)

RC—Cast-iron including some wide cast fins on the back surface for some convection effect.

CO—Convector type of copper or steel finned tubing, encased in sheet steel.

A. RECOMMENDED

American Baseboard Radiant Panels (American Radiator & Standard Sanitary Corp., Pittsburgh) RC, CO

Baseline (Baseline Mfg. Co., Minneapolis) Steel or copper. CO

Burnham "Baseray" (Burnham Corp., Irvington, N. Y.) R, RC

Dunham (C. A. Dunham Co., Chicago) Steel or copper. CO

Crane (Crane Co., Chicago) R, RC

Fedders (Fedders-Quigan Corp., Buffalo) Copper. CO

Floor Level (General Automatic Products Corp., Baltimore) CO

National (National Radiator Co., Johnstown, Pa.) Copper. CO

Nesbitt (Nesbitt Co., State Road and Rhawn, Philadelphia) Copper. CO

Sterling (H. B. Smith Co., Westfield, Mass.) Steel or copper. CO

Trane (Trane Co., La Crosse, Wis.) Steel or copper. CO

United States Radiant Baseboard (U. S. Radiator Corp., Detroit) Steel in combination radiant and convector design. CO

Vulcan, "Radi-Vector" (Vulcan Radiator Co., Hartford, Conn.) CO

Webster (Warren-Webster & Co., Camden, N. J.) CO

Weil-McLain (Weil-McLain Co., Michigan City, Ind.) RC

ELECTRONIC TEMPERATURE CONTROLS

A. RECOMMENDED

Barber-Coleman Co., 115 Loomis, Rockford, Ill.

General Controls Corp., 801 Allen, Glendale 1, Calif.

Minneapolis-Honeywell Regulator Co., Minneapolis.

▶ **REF**: Bulletin, Feb. '54.

FURNACE REPAIR RACKETS

High-pressure selling tactics of Holland Company salesmen have been the subject of frequent complaints over a period of years. The technique is for a salesman to gain access to the home by offering a "free" furnace inspection. Then the furnace may be dismantled without the owner's permission, and the homeowner is told that the furnace is in dangerous condition and should be replaced when, in fact, no such emergency exists. These tactics, which leave the homeowner at the mercy of the high-pressure salesman, have scared many into junking their good furnace and replacing it with a new *Holland* furnace. Homeowners should not accept any offer for free inspection, adjustment, or servicing of a heating system without checking with the local district attorney, Better Business Bureau, Chamber of Commerce, or fuel dealer, who will usually know whether the "inspector" is a legitimate one or is someone operating a tricky or fraudulent selling scheme.

THE SELECTION OF A DOMESTIC FUEL

For those whose homes are not located near gas mains, the choice of a fuel is limited to coal, oil, or bottled gas. Regardless of advertising claims, which are often deceptively phrased, electricity is much too expensive for home heating unless one lives in an area where electricity is very cheap, ½ cent per kilowatt-hour (with the heat pump, 1½ cents per kilowatt-hour).

While coal is the safest fuel, the necessity of removing ashes makes it relatively dirty and inconvenient, and, unless coal is burned in automatic equipment, the householder must give the furnace a good deal of attention, perhaps several times a day. Heating with oil will cost about the same as heating with coal in the hand-fired sizes, and with a 1000-gallon fuel tank buried outdoors, oil is almost as convenient as gas. Gas is cleaner than oil, but its use involves much greater hazard of fire or explosions.

Because of the wide variations in the prices of gas, no generalizations as to its cost compared with other fuels can be made. In some regions heating with gas will cost more than heating with oil, in others less.

RELATIVE COSTS
of various domestic fuels for heating

There is a great deal of misunderstanding, even among fuel engineers, concerning the relative efficiencies of the various domestic fuels. The discrepancies arise in the assumption regarding boiler and heater efficiencies in which it is incorrectly assumed that all heat going into the chimney is lost. Actually, in domestic heating, much of this heat is not lost, for it is used to heat the basement, the floor above the basement, and the walls adjacent to the chimney. After making proper corrections, and assuming proper equipment operation in each case, it is found that house-heating efficiencies in burning fuel will be about 78 percent for bituminous coal, 78 percent for hand-fired anthracite, 80 percent for oil and gas. As 90 percent is about the maximum efficiency that could be expected with perfect combustion equipment (after allowing for heat loss involved in producing adequate draft for the fire), it is obvious that any substantial savings must come from the difference in basic fuel prices on a Btu basis rather than from improvements to equipment or use of any sort of "fuel-saving" devices. All devices or elements purporting to give fuel savings of 25 percent or any other substantial amount should be regarded as examples of highly misleading advertising.

Those who are considering converting from one type of fuel to another can determine what their approximate cost for the new fuel will be by using the following information.

The heat available from 1 ton of anthracite (hand-fired sizes) or 1 ton of bituminous coal is equivalent to the heat from 1.04 tons of anthracite buckwheat or 179 gallons of No. 2 fuel oil or 48,000 cu. ft. of manufactured gas, 24,500 cu. ft. of natural gas, 277 gallons of bottled gas, 5950 kilowatt-hours of electricity. Thus, if a home required an average of 10 tons of anthracite per year at $28.50 per ton, or $285 per year, to obtain the same amount of heat from No. 2 fuel oil would require 1790 gallons at 16 cents per gallon or $285, or the same as for coal. If natural gas is to be used, 245,000 cu. ft. would be required which, at 75 cents per 1000 cu. ft., would cost $184.

Another method is to refer to Table I, substituting the prevailing prices for the various fuels obtainable in your area. For example, if the price for hand-fired anthracite in your area is $25 per ton instead of $28.50, the equivalent cost for coal would be 100 × 25 ÷ 28.50 or $88, instead of $100. If No. 2 fuel oil is 18 cents per gallon instead of 16 cents, the equivalent cost for fuel oil would be 100 × 18 ÷ 16 or $112, instead of $100. Thus, oil would be 112 minus 88 ÷ 88 × 100 or about 25 percent more expensive than coal.

SAVING HEAT AND FUEL

The numerous gadgets and chemical compounds that are sold with claims of producing substantial fuel savings are nearly always accompanied by instructions covering the care and operation of the heating plant. Any savings the consumer obtains is usually from following those instructions rather than from the gadget or chemical which he has been sold; he will save time and money by using proper firing methods rather than purchasing a useless or possibly even potentially dangerous accessory.

Heat savers

There are several contrivances on the market which claim to save substantial amounts of fuel (up to 40 percent) by reclaiming some of the heat that goes up the chimney.

Actually, the amount of heat so lost, above that which is required to provide sufficient draft, is very small in a properly adjusted and operated heating system. The maximum possible saving that could be realized in practice would not amount to more than 9 percent with oil and 5 percent with gas—very small considering that

TABLE I—COMPARATIVE COST IN DOLLARS OF DOMESTIC FUELS

(Corrected for efficiency of heating units)

1	2	3	4	5	6
Type of Fuel	Heat content in Btu	Present average price†	House heating efficiency	Average cost per million Btu*	Equivalent cost (anthracite= 100)
Anthracite (hand fired)	26,000,000/ton	$28.50	78%	$1.40	$100
Anthracite (buckwheat)	25,000,000/ton	19.25	78	1.00	72
Bituminous coal	26,000,000/ton	16.25	78	.80	57
No. 2 fuel oil	141,800/gal.	0.16	80	1.40	100
Manufactured gas	525,000/m cu. ft.	1.40	80	3.35	240
Natural gas	1,030,000/m cu. ft.	0.75	80	.90	65
Bottled gas (propane)	91,500/gal.	0.14	80	1.90	135
Electricity	3,415/kwhr.	0.03	100	8.80	630

* Corrected for efficiency.

† As there is a wide price variation from city to city, actual local prices should be substituted for a reliable comparison, and necessary computation made for figures in columns 4, 5, 6 (see text).

use of such heat savers may introduce serious hazards and adversely affect furnace operation.

Chemical treatments

Products to be sprinkled on a coal fire to "improve combustion" and products to be added to fuel oil to prevent formation of soot and make the oil burn better are generally useless and a waste of money. One so-called chimney and flue cleaner, a packaged product, had a composition similar to gunpowder and was the cause of a factory explosion that killed one man, injured 15, and caused $2,000,000 damage.

It is not generally wise to buy a fuel oil additive to be put into your tank to reduce corrosion of the tank by the fuel. Your fuel already may contain an anti-rust or anti-sludge chemical added in the refinery or by the dealer. It is unwise to add anything to your fuel oil except as you may be advised to do so by letter from the home office of the refining company, which knows what is already in their furnace oil.

Changing the thermostat setting at night

Can fuel be saved by turning the thermostat to a lower setting at night? Tests made at the University of Illinois with radiant baseboard heating have shown that lowering the thermostat setting 6 degrees at night (from 72 degrees to 66 degrees) resulted in a fuel saving of about 5 percent if the windows were all kept closed. When the bedroom windows were opened at night and the thermostat set down to 66 degrees, daily fuel consumption was about the same as when the thermostat was kept at 72 degrees at all times with the windows closed.

SAFETY OF FUELS AND FUEL BURNING EQUIPMENT

Coal

Coal is considered the safest fuel, since neglect or maladjustment as a rule results only in the fire burning low or going out, without damage or danger. The only precautions usually necessary are to be sure that there is ample draft available under all conditions of weather and wind and that firing of fresh coal is done in such a manner as to prevent emission of noxious gases to the house. Any noticeable odor from a coal heater is a sign of danger that should be rectified by a competent furnace serviceman. (There are occasional instances in which gases from coal fires leak back into a house and cause death by carbon monoxide poisoning. Sometimes these accidents have been caused by small explosions that occurred in the furnace which blew the smoke pipe away from its connection with the chimney — hence the importance of properly placing the coal on the fire, so as not to cover the whole burning surface with new coal.)

Gas

Consumers' Research considers gas to be the least safe of all domestic fuels. It is completely dependent for safety on mechanical controls, which may occasionally fail.

The consumer who uses natural, manufactured, or mixed gas should take the following steps to guard against fire and explosion hazards: (1) insist that the house-heating installation be equipped with an individual emergency relief vent opening outdoors to provide a defense against accidentally occurring excessive pressure; (2) a readily accessible shut-off cock should be provided at the curb and be kept accessible at all times; (3) the gas should be tested frequently for sufficient odor to provide warning, and insist on correction, if it is lacking; (4) have all stem-type valves replaced with approved gas plug-cocks; (5) be sure that regulator diaphragms and packings are of *natural-gas*-resistant materials; and (6) refuse to be satisfied with a gas appliance that is frequently out of order, loses its pilot flame, or requires adjustment.

With *any type of gas,* it is very important that every safety control recommended by the manufacturer should be included; *all* equipment should meet the approval requirements of the A.G.A. and bear their seal attesting to the fact; all installations and adjustments should be made by competent mechanics, fully trained and experienced in the *gas* field; and finally, the completed installation should be inspected by public utility or municipal engineers (depending upon the situation in your city), and their recommendations must be scrupulously followed.

Gas is the least dependable of fuels. Breakdowns of gas transmission facilities due to excessive demand in extreme weather or other unpredictable emergencies can interrupt heat supply to thousands of homes simultaneously. Gas-burning equipment must be given close periodic care and adjustment by competent servicemen even though, at any given time, all phases of operation may seem to be normal and satisfactory.

One hazard with gas results from the hasty, low-cost conversion of thousands of appliances originally designed for manufactured gas to accommodate natural gas. In instances where difficulties have been experienced, it is desirable to install new heating elements and pilot burners approved for use with natural gas by the American Gas Association Laboratories or other recognized approval agencies, rather than to try to make adjustments or modifications in burner equipment that was designed primarily for manufactured gas.

The differences between manufactured and natural gas are such that many burners and appliances designed for one may be wholly unsuited to the other. The mere adjustment of a manufactured-gas burner to natural-gas operation may result in such inefficient and even hazardous conditions as: lifting the flame with dangerous extinguishment of the fire; failure of gas from some ports to ignite, with consequent escape of unburned or partially burned gas; excessive impingement of flame upon heating surfaces with formation of soot or poisonous carbon monoxide; restriction of the range of proper ignition, i.e., limiting the ability of the burner to be turned low; formation of carbon at the orifices with clogging of the burner ports; objectionable noise when the burner shuts off; and overheating of burner heads.

By far the most signal difference between manufactured and natural gas is the extremely high pressure at which the latter originates. Manufactured gas is made and transmitted in a system which works at very low pressure, and unless the pressure has been purposely boosted for transmission over a considerable distance, it is virtually impossible for more than a relatively few ounces of pressure per square inch to develop in the home; in contrast, natural gas transmitted over great distances is usually carried at the very high pressure of about 700 pounds per square inch; this pressure is several thousand times the safe pressure limit of domestic distribution systems.

In delivering natural gas for household and commercial uses, the pressure must be reduced to the requisite few ounces per square inch through a series of mechanical reducing devices. The industry has gone on the theory that these devices are uniformly reliable and safe, but they do, of course, fail from time to time; their failure can have very serious consequences and bring death and destruction to many.

Gas, that escapes from pipe joints that have become leaky, under the street surface, or from pipes which have been broken by accident or other cause, tends to find its way into cellars through crevices and openings along the utility pipe lines that enter houses and commercial buildings. This type of leakage may occur with any kind of gas, but the danger is more pronounced with natural gas.

LP (liquefied petroleum) gas

LP gas, which is widely used where manufactured or natural gas is not available, has two particularly hazardous characteristics that call for a degree of vigilance even exceeding that required with natural and manufactured gas. (1) It is heavier than air; if it leaks, it tends to collect in cellars, under houses, in sewers, and other low spots, to remain there until ignited; and (2) it will leak through the smallest imaginable openings, and therefore the piping and containers to handle it must be of extremely good workmanship, and especially carefully inspected.

Bottled LP gas has so many points of potential hazard that, before using it for domestic purposes, consumers are strongly advised to secure and read an excellent pamphlet—No. I-140 LP Gas—Safe Handling and Use, 20 cents, from the Accident Prevention Department of the Association of Casualty and Surety Companies, 60 John St., New York 38.

Fuel oil

A large number of fires are traced to fuel oil each year. A vast majority of these fires originate in small heating and cooking equipment, usually of the portable type. Portable oil stoves have proven so hazardous that they have been banned entirely by the fire codes of New York, Philadelphia, and many other cities. The Philadelphia code reads (par. 5-3106): "No person shall use or permit to be used on his premises any portable heating or cooking device employing as fuel any flammable liquids."

Centrally-fired oil (as distinguished from portable and space-heating oil heaters) was, in its early stages of development, responsible for a number of destructive fires; now, however, development has progressed to a point where almost all cases of trouble with modern oil burners (of reputable makes) can be traced to failure to keep the equipment clean, in proper repair, and regularly serviced. (The importance of regular skilled servicing cannot be overemphasized.)

Home maintenance and water supply

HOT-WATER SUPPLY

Water temperatures above 150 degrees tend to shorten pipe and tank life and can cause accidental scalding. For that reason, it is recommended that the water temperature in any tank be limited by a thermostat to 150 degrees (140 degrees is better). Indeed, some manufacturers' tank guarantees are void if temperatures are not held to or below the limit specified.

Tempering valves are available that enable the homeowner to have hot water at two different temperatures if he desires—very hot (directly from the tank) for the dishwasher or washing machine and moderately hot (through the tempering valve) for washing and dishwashing by hand and for bathing.

While galvanized tanks may last reasonably long when connected with copper piping, there is a risk in such an installation, for the use of dissimilar metals in a closed system usually promotes corrosion. Corrosion damage is usually worse when the copper is located between the tank and the source of water supply, i.e., upstream from the tank. In general, corrosion problems are reduced if the hot-water system is constructed with galvanized steel throughout, or with copper throughout (unless, as in some cases, experience with the water supplied in the particular community has proved the combination of dissimilar metals to be satisfactory). Corrosion is not usually a problem with nonferrous tanks unless connected to galvanized or black iron piping, in which case there may be severe galvanic corrosion of tank or piping at the junction.

Aluminum tanks may corrode rapidly where there is even a slight trace of iron or copper in the water. On this account, it is thought that the use of aluminum hot-water tanks may prove to be impractical in some areas.

Magnesium rods, or anodes, are used extensively to combat corrosion, by providing "cathodic protection." While the anodes help materially in many cases, there are many exceptions and in some cases even disadvantages in their use.

The effect of anodes is sometimes worse than corrosion because cloudiness in the water and deposition of sludge may occur. Some consider that the combination of magnesium anodes and fluoridation of water presents a possible hazard to health.

Anodes are most effective when used with vitreous enamel ("glass") or "stone"-lined tanks, because there is much less bare metal area to be protected. However, since some slight cracks and breaks are almost sure to be present in the coatings of such tanks, manufacturers' claims that they do not need anodes are overly optimistic.

While dielectric unions are helpful in reducing corrosion in water systems at points where dissimilar metals are found (for example, where copper piping is connected to a galvanized tank), recent studies indicate that it may be best *not* to employ them with electric hot-water heaters. (The reason is that during a lightning storm conditions occasionally arise which make it desirable that *all* elements of the water and the drainage system, including the electric water heater, be connected electrically to ground.)

Hot-water storage tanks

In general, gas water heaters have "fast recovery." A full tank of hot water is available in from 45 to 95 minutes; coal is intermediate in speed, requiring 3 hours; electricity is slow, normally requiring 6 hours or even more. Thus coal or electricity requires a larger storage tank than is needed with gas. The consumer may use the table following in considering coal and electricity for heating water, if he will select, for coal, 1½ times the tank sizes shown, and, for electricity, twice the tank sizes shown (unless the electric hot-water heater is of the new fast-recovery type which has very high wattage, usually two 4500-watt elements).

SIZE RECOMMENDATIONS FOR AUTOMATIC STORAGE-TYPE GAS WATER HEATERS

Number of bathrooms	Number of bedrooms	Minimum tank size, gal.
1	1 or 2	30
1	3 or 4	40
2	2 or 3	40
2	4 or 5	50
3	3	50
3 or 4	4 or 5	75 or 100

It is necessary for safety that all gas-fired heaters should be vented to the outside by a suitable flue.

Thickness of insulation should be checked. With thermostatically controlled gas heat (the only kind of gas heat that is reasonably safe), 1 inch of fiber glass should be considered the minimum acceptable, with 1½ inches being entirely adequate. With electricity, thick insulation is more necessary and desirable because of the much higher fuel cost.

Regardless of fuel, *all* water heaters should be equipped with valves that will relieve *both* excessive pressure and temperature. Disastrous explosions have been caused by the omission of either one or both of these safety provisions from hot-water heater installations. Explosions have also occurred in jack stoves and ranges with water jackets in which use of the water jackets had been discontinued and the pipe ends plugged.

Approximate cost of heating domestic service water with various fuels

Fuel and unit of sale	1 Unit price $	2 Cost per therm (100,000 Btu) $	3 Total monthly cost† (relative, based on use of 2500 gal.)* $
Electricity, kilowatt-hour (3415 Btu/kwhr.)	0.01	0.29	6.00
	0.02	0.59	12.00
	0.03	0.88	18.00
	0.04	1.17	24.00
Manufactured gas, 1000 cu. ft. (mcf.) (525 Btu/cu. ft.)	1.00	0.19	5.40
	1.50	0.29	8.10
	2.00	0.38	10.70
Natural gas, 1000 cu. ft. (mcf.) (1000 Btu/cu. ft.)	0.50	0.05	1.40
	1.00	0.10	2.70
	1.50	0.15	4.10
L-P (bottled) gas, gallon (90,000 Btu/gal.)	0.10	0.11	3.00
	0.20	0.22	6.10
	0.30	0.33	9.10
	0.40	0.44	12.20
Fuel oil, gallon (140,000 Btu/gal.)	0.12	0.09	3.60
	0.16	0.11	4.60
	0.20	0.14	6.00
Anthracite, ton (13,000 Btu/lb.)	15.00	0.06	4.00
	20.00	0.08	5.10
	25.00	0.10	6.50

† Assuming 100°F temperature rise, such as 50°F to 150°F.
* Includes monthly standby cost, which is the expense incurred whether or not any hot water is used. It includes costs such as those for maintaining a fire, pilot burners, and heat radiation, conduction, and convection losses which serve only to heat the room where the water heater is situated.

On gas-fired heaters, look for the seal denoting approval by the American Gas Association (AGA), on electric heaters, for the label of the Underwriters' Laboratories (*UL*).

Cost of heating water

CR has prepared the accompanying table for those who consider the actual monthly cost of heating water a determining factor in making a choice.

Attached-type service water heaters

For attachment to, or insertion in, steam and hot-water house-heating boilers.

I—Indirect type, for use with separate storage water tank.

T—Tankless type, having sufficient capacity for instantaneous water supply without tank.

A. RECOMMENDED

B. & G. (Bell & Gossett Co., Morton Grove, Ill.) I, T

Excelso (American Radiator & Std. Sanitary Corp., Pittsburgh) I

General (General Fittings Co., Providence, R.I.) T

Paracoil (Davis Engineering Co., Elizabeth, N.J.) I, T

Taco (Taco Heaters, Inc., Providence, R.I.) I, T

Yula, Models 1, 2, 3 (Yula Water Heaters, Inc., N.Y.C.) T

Gas-fired automatic storage water heaters

Ratings are cr58.

A. RECOMMENDED

Basmor (Bastian-Morley Co., Inc., La Porte, Ind.) *One Hundred, Two Hundred,* and glass-lined *Three Hundred Series.*

Bryant (Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair, Cleveland 10) *Chrystalglas Series.*

C and L (Clayton & Lambert, Louisville 10) *Series G* and *Hoffman Super HP Series.*

Continental (Continental Water Heater Co., 1801 Pasadena Ave., Los Angeles 31) *Glasteel, Gladiator,* and *Table Top Series.*

Crane (see *Basmor*).

Everhot (Everhot Heater Div., 5189 Wesson Ave., Detroit 10) Glass lined.

Fairway (Montgomery Ward & Co., Chicago)

Gaffers and Sattler (Mission Appliance Corp., 12611 Crenshaw Blvd., Hawthorne, Calif.) *Supreme* and *Deluxe* models.

Homart (Sears, Roebuck & Co., Chicago 7) *Series 600.*

Hotstream (Hotstream Heater Co., 2363 E. 69, Cleveland 4) *Everglas, DeLuxe Everglas, American "D", Dixie "R2"*, and table-top *Model TT.*

Jackson (W. L. Jackson Mfg. Co., 1216 E. 40, Chattanooga, Tenn.) *Master* and *Glasslined Standard* and *Project* models.

John Wood (John Wood Co., Conshohocken, Pa.) *Deluxe* and *Master Glasslined Series.*

Koven (L. O. Koven & Bros., 154 Ogden, Jersey City, N. J.) *A. Recommended* only when guaranteed for 10 yr.

National (National Steel Construction Co., Logansport, Ind.) See *Continental.*

Penfield (John Wood Co.) *Deluxe Series, Master "A" Series.*

Pennsylvania (Pennsylvania Range Boiler Co., 24 and Ellsworth, Philadelphia 46) *Deluxe Series, Bradford Series, Standard Vitraglas,* and glass-lined table-top models.

Ruud (Ruud Mfg. Co., Kalamazoo 24, Mich.) *Hi-speed* and *Laundrymaster,* galvanized; *Monel* and *Monel Laundrymaster,* monel metal; and *Alco Alloy,* aluminum alloy.

Saf-T-Hot (M. M. Hedges Mfg. Co., E. Main and Madison, Chattanooga, Tenn.) *SG-M Series.*

Sands (Sands Mfg. Co., 5407 Sweeney Ave., Cleveland 27) *NS Series.*

Toastmaster (McGraw Electric Co., 5201 W. 65 St., Chicago) *Commander* (with 100% control) and *Ionodoglas Models.*

Trageser (Trageser Copper Works, Inc., 5000 Grand Ave., Maspeth, L.I., N.Y.) Copper-lined tank.

Whitehead (D. W. Whitehead Mfg. Corp., 1218 Walnut Ave., Trenton 9, N.J.) *Deluxe* models.

B. INTERMEDIATE

Heaters in this section are rated *B. Intermediate* because of such factors as lighter construction, absence of fully automatic controls (such as a pilot burner control), and shorter guarantees. Prices are usually somewhat less than for otherwise similar *A-Recommended* models.

Basmor (Bastian-Morley Co., Inc.) *Three Hundred* and *Four Hundred* with galvanized lining, and *Scout Series.*

Bryant (Bryant Heater Div.) *Bulldog Series 3-114, 3-114R.*

Continental (Continental Water Heater Co.) *Economy.*

Crane (see *Basmor*).

Everhot (Everhot Heater Co.) *Deluxe* and *Rocket Series.*

Gaffers and Sattler (Mission Appliance Corp.) *Crenshaw* models.

Hoffman (Clayton & Lambert Co.) *Series CFSO.*

Homart (Sears, Roebuck & Co.) *Series 400.*

Hotstream (Hotstream Heater Co.) *Ohioan Series.*

John Wood (John Wood Co.) *BG Series.*

Pennsylvania (Pennsylvania Range Boiler Co.) *Standard Series, Vitraglas Model* excepted.

Saf-T-Hot (M. M. Hedges Mfg. Co.) *SI-D Series.* Cold-water connection at the bottom (undesirable).

Sands (Sands Mfg. Co.) *JD* and *BG Series.*

Wilshire (Southern Heater Corp., 133 E. Palmer Ave., Compton, Calif.) *Series "A," "AG."* Claim of fast reheat not warranted by reported 71 min. for 30 gal.

▶ **REF:** BULLETIN, Aug. '55+++, Sept. '55+++.

Electric automatic storage water heaters

Ratings are cr58.

A. RECOMMENDED

Basmor (Bastian-Morley Co., Inc., La Porte, Ind.) *Six Hundred,* both regular and fast-recovery types.

Fairway (Montgomery Ward & Co., Chicago) Both regular and fast-recovery models.

Frigidaire (Frigidaire Div., General Motors Corp., Dayton 1, Ohio) Both regular and fast-recovery types.

Hoffman (Clayton & Lambert Mfg. Co., 1701 Dixie Highway, Louisville 10) Regular type only. *Series "R," "TR."*

Hotpoint (Hotpoint Inc., 5600 W. Taylor, Chicago 44) Both regular and fast-recovery types.

Hotstream (The Hotstream Heater Co., Cleveland 4) Galvanized and glass-lined models, with 10-yr. warranty.

Hubbell (The Electric Heater Co., Stratford, Conn.)

Jackson (W. L. Jackson Mfg. Co., Chattanooga, Tenn.) Regular type, glass lined and galvanized, with 10-yr. warranty.

John Wood (John Wood Co., Conshohocken, Pa.) Regular type.

Koven (L. O. Koven & Bros., Inc., 154 Ogden Ave., Jersey City 7)

L. & H. (A. J. Lindemann & Hoverson Co., Milwaukee 7) Both regular and fast-recovery types.

Norge (Norge Heat Div., Borg-Warner Corp., Hammond, Ind.)

Permaglas (A. O. Smith Corp., Milwaukee)

Rheem (Rheem Mfg. Co., New York 18; distributed by General Electric Supply Co.) Both regular and fast-recovery types.

Sepco (Automatic Electric Heater Co., Pottstown, Pa.)

Toastmaster (Clark Div., McGraw Electric Co., Chicago 38) Both regular and fast-recovery types.

Westinghouse (Westinghouse Electric Co., Mansfield, Ohio) Both regular and fast-recovery types.

Whitehead (D. H. Whitehead Mfg. Co., 1218 Walnut Ave., Trenton 9, N.J.) Regular type.

Oil-fired automatic storage heaters

B. INTERMEDIATE

Dowagiac (Dowagiac Steel Furnace Co., Dowagiac, Mich.)

Duo-Therm (Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.)

Gillen (L. J. Gillen Co., 12202 Wormer, Detroit)

Norge (Norge Heater Div., Borg-Warner Corp., Hammond, Ind.)

Scotsman (American Gas Machine Co., Albert Lea, Minn.)

Coal-fired "bucket-a-day" heaters

B. INTERMEDIATE

"blue coal," deluxe (D. L. & W. Coal Sales Co., N.Y.C.)

Freed (Freed Heater Co., Collegeville, Pa.)

Locke (Locke Stove Co., Kansas City, Mo.)

Peerless (Eastern Foundry Co., Boyertown, Pa.)

PROVIDING A SAFE SHOWER

Water drawn from a hot-water storage tank ordinarily changes temperature slowly. Water supplied by an instantaneous, submerged, or indirect heater can change in temperature very rapidly.

A shower that runs hot and cold is not only uncomfortable, but dangerous. The bather runs the risk of serious burns, and in addition can fall and be injured in attempting to escape the hot or cold water. A thermostatic mixer is desirable, of a type that compensates for changes of both supply pressure and temperature.

A. RECOMMENDED

Powers Thermostatic Control Hydroguard (Powers Regulator Co., Skokie, Ill.)

WATER SUPPLY PIPING

Water supply piping in common domestic use is either plain or galvanized steel, or made of copper, or red brass containing 85 percent copper. No significant difference in corrosion resistance has been found between *steel* and *wrought iron* pipe in domestic applications. There is no single type of pipe material in common use which is fully satisfactory for all types of waters.

Copper and *red brass,* though generally more resistant to corrosion than iron and steel, are attacked by certain types of water. Further, the copper dissolved from these pipes, if deposited on a galvanized surface downstream, leads to rapid failure of the galvanized pipe or tank. *Copper* presents a definite health hazard if one drinks water that has stood long in copper pipes and has a metallic taste. Water that has been standing in pipes of any kind should be run off before water is drawn for drinking or cooking, and water from the hot-water lines should not be used for either drinking or cooking.

Aluminum water piping is not, in general, suitable for use in homes; it tends to corrode rapidly if the water is alkaline or has flowed first through copper or brass piping.

Plastic pipe (usually polyethylene) has not as yet been approved for use by the national plumbing code, and is not recommended for carrying water at temperatures above 120°F nor for use in piping systems within the house.

Lead, because of its poisonous qualities, is wholly undesirable, even in short lengths, for pipes for potable water, for human beings or animals.

Yellow brass, formerly in wide use, is no longer recommended, as it is subject to corrosion damage.

▶ **REF:** BULLETIN, Mar. '54.++++

WATER SOFTENERS

Among the reputable companies marketing comprehensive water treatment and water softening equipment for installation as a part of the water system and maintaining advisory services are:

Crane Co., 836 S. Michigan Ave., Chicago.

Culligan Inc., South Shermer Road, Northbrook, Ill.

Duro Co., Monument and Webster St., Dayton 1, Ohio.

Elgin Softener Corp., 142 N. Grove Ave., Elgin, Ill.

HomEase Products Co., 52 Iowa Ave., Paterson 3, N. J.

Hungerford & Terry, Inc., Atlantic Blvd., Clayton, N. J.

Land A Water Softener Co., 1007 Airway, Glendale 1, Calif.

Permutit Co., Inc., 330 W. 42 St., New York 36.

Red Jacket Mfg. Co., Davenport, Iowa.

Refinite Corp., P. O. Box 1312, Omaha, Nebr.

The Herbert Wolcott Co., Columbia 1, Mo.

Zero Water Softener Mfg. Co., Elston at Kimberly Ave., Chicago 30.

The reader should also refer to the information under "Water softening," page 38.

ANTI-CORROSION DEVICES

Various devices which are claimed to protect water systems from corrosion continue to enjoy considerable publicity. These generally take the form of cast fittings inserted into supply lines, or assemblies of copper and zinc or copper and magnesium in disks, spirals, or other forms which are inserted in the water system. Their promoters do not give scientifically-supportable reasons for their claimed action, although the sales literature often includes impressive arrays of technical words assembled in a fashion which is beguiling to the layman. Careful laboratory tests by unbiased authorities have not shown any effective methods of water treatment and corrosion protection that do not require regular renewal or replacement of an active chemical material.

WATER SUPPLY FOR RURAL HOMES

A shallow-well pump can lift water about 22 feet and may be installed in any convenient location that is not too far from the well.

If the water line is more than 22 feet below the pump, a deep-well pump is required. It may be placed directly at the wellhead or within the pipe, below the water level.

Shallow-well pumps

These are available in three general types: (1) reciprocating pumps, (2) centrifugal pumps, and (3) turbine pumps.

Reciprocating pumps are available with one or two cylinders and are normally belt-driven from an electric motor, sometimes a small gasoline engine. They are not complicated mechanically and thus comparatively easy to service by anyone having some mechanical skill. The pulsating noise produced, most noticeable on long lifts, is often a disadvantage with these pumps.

Centrifugal pumps are compact and simple in design; their pumping capacity decreases as the height of lift or the storage tank pressure increases. They are more efficient than the piston type when used within the pressure range for which they are designed. The whine produced during operation is not too annoying. Some that are self-priming are considerably less efficient. (See also "Jet," on this page.)

Turbine pumps are manufactured to very close tolerances and are therefore best suited only for pumping very clean water. If used to pump water containing slight amounts of sand or other abrasive material, they will be subject to excessive wear. With clean water, need for servicing is infrequent and efficiency is about the same as with a piston pump. Turbine pumps make a shrill whining sound, which may be annoying.

Deep-well pumps

These are available in four general types: the turbine, the submersible, the jet, and the older so-called working head (piston pump).

Turbine. The turbine is located directly over the well casing. A shaft extension goes down the well so that the impellers are always below the water level in the well. The useful capacity depends upon the height of lift and the power of the motor used. Efficiency is relatively high and running noise very slight.

Submersible. The submersible is a turbine pump, with a sealed motor so that motor and impeller can be located in the well below the water level. It is less expensive than the deep-well turbine, somewhat less efficient, and produces little or no noise in the house.

Jet. A jet is a type of centrifugal pump which employs a jet and coned-tube arrangement located below the water level in a deep well (some are available which can be used with a shallow well). Because there are no moving parts within the well, the pump proper can be located at a convenient place, as in a basement, garage, or shed at some distance from the well. Jet pumps are inefficient but well adapted to the smaller 2- to 3-inch diameter wells. They make some noise, a whirring sound which is not too annoying.

Working head. In the working head pump, a reciprocating mechanism, usually belt-driven by a motor, is connected directly by rods to a piston pump located below water level. This type of pump, though heavy (and cumbersome), is easily understood by most repairmen and therefore easily kept in order. It is relatively noisy, emitting a pulsating sound, and of average efficiency.

* * *

The following listed pumps are generally available in a choice of several capacities from 250 to 4500 gallons per hour, as driven by motors of from ¼ to 3 horsepower. The smaller models are usually available as package units, with all essential components assembled and mounted on a single base.

In the listings, the different types of pumps are designated by: C, Centrifugal; J, Jet; R, Reciprocating; S, Submerged.

A. RECOMMENDED

Aurora (Aurora Pump Co., Aurora, Ill.) J

Berkley (Berkley Pump Co., 829 Bancroft Way, Berkley 2, Calif.) C, J

Deming (Deming Co., Salem, Ohio) Shallow well—C, J, R. Deep well—C, J, R, S.

Dempster (Dempster Mill Mfg. Co., Beatrice, Nebr.) R, C, J

Fairbanks Morse (Fairbanks Morse & Co., Chicago) Shallow well—R. Deep well—R.

Goulds (Goulds Pumps, Inc., Seneca Falls, N.Y.) J, R

Homart (Sears, Roebuck & Co.) Shallow well—J, R. Deep well—J, S.

Lancaster (Lancaster Pump & Mfg. Co., Lancaster, Pa.) C, J, R

Myers (F. E. Myers & Bros., Co., Ashland, Ohio) C, J, R

Peerless (Peerless Pumps Div., 2055 Northwestern, Indianapolis) Shallow well—J. Deep well—J.

Rapidayton (Rapidayton Div., The Tait Mfg. Co., Dayton 1, Ohio) Shallow well—J, R. Deep well—J, R, S.

Red Jacket (Red Jacket Mfg. Co., Davenport, Iowa) Shallow well—C, J, R. Deep well—J, R, S.

Wards (Montgomery Ward & Co.) Shallow well—J, R. Deep well—J, S.

▶ **REF:** BULLETIN, Jan. '54.++

SEWAGE DISPOSAL

When located, installed, and functioning properly, a septic tank (1) receives and retains the sewage; (2) digests most of the solids; (3) stores the remaining solids; (4) directs the liquid to the subsurface drainage, seepage, and absorption area. If the absorption area is too small, or the soil of a kind which does not absorb water well, the system may give trouble.

The septic tank may be made of steel, tile, or concrete cast in place. It must be watertight. The tank should have at least a 500-gallon capacity, and an additional 100 gallons per person in excess of five should be allowed. If the effluent from a garbage disposal unit is to be discharged into the system, provide a tank volume 50 percent over that normally required.

If a septic tank system is properly installed, there will be no need to add yeast, "enzymes," bacterial or other starters or treatments, to new or old tanks. These are not effective, and there is no need to use any proprietary product in a home septic tank system. The "medicine" may in some cases even be detrimental to the proper operation of a septic tank.

The use of ordinary amounts of drain solvents, mild cleaning agents, disinfectant solutions, and synthetic detergents will not affect the operation of the tank adversely after it has been in operation long enough to have accumulated a little sludge.

Drainage from roofs, foundations, and other sources which produce large volumes of clear water should not be fed to the septic tank or drained in or close to the absorption field of the tank.

A septic tank should be inspected regularly and pumped out when the total depth of scum and sludge added together equal or exceed one third to one half the liquid depth of the tank. It is best to have this work done by a local concern of established repute. In some sections of the country, itinerant tank cleaners are grossly overcharging customers for inadequate tank-cleaning service.

Cesspools, because they are merely porous-walled cisterns which drain off the fluids of the sewage, are unsatisfactory means for disposal of sewage. They are likely to cause serious contamination of the soil and water supplies even at considerable distances.

▶ **REF:** BULLETIN, Feb. '57.+++ • Manual of Septic-Tank Practice, U. S. Department of Health, Education, and Welfare, Public Health Service Publication No. 526; for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.; price, 35 cents.

STORM SASH AND SCREENS

From the standpoint of comfort, with appreciable savings in cost of heating, storm sash are recommended where the average January temperature is 35°F or colder. They are also highly recommended for use in rooms that are air conditioned in the summer to get the maximum benefit from the cooling capacity provided. Protection of windows from the direct rays of the sun by trees and awnings is also helpful.

Storm sash

Storm sash are available made of either wood or metal (usually aluminum). The cheapest is merely a full-length fixed-glass sash. A more expensive kind consists of a permanent frame with interchangeable glass and screen panels. Next higher in cost is a double-track type with interchangeable glass and screen panels operating on tracks like a double-hung window. The unused elements must be removed for storage from some windows of this type; others are "self-storing." The triple-track type provides for independent up-and-down motion of two glass panels and a screen panel.

Never permit yourself to be pushed or hurried into signing any contract for storm windows; it is best always to get written bids from established local firms that you can check on for honesty and fair dealing.

Beware of misleading advertising. Much of the selling of storm windows is done with various forms of deceit from "bait advertising" to arrant overcharging and outright fraud. The Better Business Bureau points out that they "have learned from bitter experience that any offer which sounds too good to be true *is* usually just too good to be true."

"Bait advertising" consists of: (1) advertising the product at a very attractively low price, (2) "knocking" the advertised product and refusing to sell it, and (3) switching the customer to windows selling at several times the price he had expected to pay. Consumers can protect themselves by remembering these earmarks of sharp practice and stopping negotiations immediately upon detecting signs of baiting, deception, or trickery. Some of the sellers of storm windows against whom the Federal Trade Commission has brought action have used the names *Apex, Ace, Famous, Martin,* and *Mid-Tex.*

▶ **REF:** Insulating-Windows and Screens, University of Illinois Small Homes Council, Urbana, Ill., Circular Series F-11.2, 15 cents.

Aluminum storm sash and screen combinations

Code letters, S, D, and T, in listings refer to availability of panel (single-track), double-track, and triple-track types, respectively.

A. RECOMMENDED

Allied (Allied Metals, Inc., 14 Hamilton, New London, Conn.) D, T

All-Time (All-Time Mfg. Co., 293 Park, New Britain, Conn.) T

Alwintite (General Bronze Co., Stewart Ave., Garden City, L.I., N.Y.) T

American (American Heating & Appliance Co., 227 S. 62, Philadelphia) T

Burrowes (Burrowes Corp., Portland, Maine) D, T

Eagle-Picher (Eagle-Picher Sales Co., 900 American Bldg., Cincinnati) T

Kane (Kane Mfg. Corp., Kane, Pa.) T

Keystone (Keystone Alloys Co., Derry, Pa.) D, T

Kota (Kota Products, Inc., Route 25A, Rocky Point, N.Y.) D, T

Orange (Eagle-Picher Sales Co.) T

Wards (Montgomery Ward, Chicago 7) D. Similar to *Kota.*

Watson (Watson Mfg. Co., Jamestown, N.Y.) D

B. INTERMEDIATE

Alsco (Weatherguard Corp., 501 King, Philadelphia) S, D, T ¶This company also sells the same windows under the name *Weatherguard.*

Hunter (Hunter Mfg. Co., Emily, Pa.) Rolled aluminum. D

Kaufmann (Kaufmann Corp., 17210 Gable, Detroit 12) S, D, T

Wooden storm sash and screen combinations

A. RECOMMENDED

Hess (Hess Planing Mill Co., 200 N. Franklin, Waynesboro, Pa.) Redwood. S

B. INTERMEDIATE

Anderson (Anderson Corp., Bayport, Minn.) Treated pine. S

Vacol (V. E. Anderson, Owensboro, Ky.; also distributed by Montgomery Ward & Co.) White pine, treated with a wood preservative. S

▶ **REF:** Bulletin, May '54.+++

Screen materials

Listed in descending order of desirability, the more popular domestic screen materials are: (1) commercial bronze (not a true bronze) and copper, (2) aluminum, (3) plastic and glass fiber and (4) galvanized and black painted steel. The last named, unless painted every year (which is a bother, and fills up the mesh with paint), corrodes rapidly, and is thus a very poor buy. Cheap in first cost, it is almost always the most expensive in the end. Screens made of plastic and galvanized steel can be recommended only where first cost is the prime consideration.

The 16 x 16 and 14 x 18 mesh have been found (University of Florida) to be equally effective in keeping out insects, but no screen of larger mesh (smaller numbers) should be considered. The smaller mesh (18 x 18) screening is not desirable, because of higher cost and greater obstruction of light.

▶ **REF:** Bulletin, Aug. '54+++, July '55+.

TRANSLUCENT BUILDING PANELS

Translucent panels made of either structural glass or plastic with glass fiber reinforcing offer practical solutions to many constructional problems in the home. They can be used for partitions, screening, roofing, and in other applications.

Prices vary with type of material, thickness, and freight, starting at about 60 cents per square foot. The following manufacturers and retailers provide relatively satisfactory products. Unless otherwise noted, their panels are made of plastic with glass fiber reinforcement.

Alsynite (Alsynite Co. of America, San Diego 9) Corrugated, flat, and ribbed panels.

Barclite (Barclay Mfg. Co., Inc., Barclay Bldg., New York 51)

Corrugated Glass (Pennsylvania Wire Glass Co., Philadelphia 3) Corrugated glass.

Corrulux (L-O-F Glass Fibers Co., P.O. Box 20026, Houston 25, Tex.)

Filon (Filon Plastics Corp., El Segundo, Calif.) Flat or corrugated panels.

Homart (Sears, Roebuck & Co., Chicago) Corrugated sheets only.

Mississippi (Mississippi Glass Co., 88 Angelica St., St. Louis 7) Glass in a wide variety of patterns.

Resolite (Resolite Corp., Zelienople, Pa.) Flat or corrugated.

Tropiglas (Russell Reinforced Plastics Corp., Lindenhurst, L.I., N.Y.) Flat sheets only.

Wards (Montgomery Ward & Co., Chicago) Corrugated sheets only.

INSULATION

The effectiveness of insulation depends upon its characteristics, the way it is installed, and upon its location in the house. For instance:

Ceiling and roof insulation is especially effective for summer comfort and winter fuel economy. It has little effect upon cold weather comfort because the human body does not lose much heat by radiation to the ceiling.

Wall insulation is effective for fuel economy and is often necessary for cold weather comfort.

Floor insulation is necessary for comfort and fuel economy chiefly when the floor is laid over unheated spaces.

Windows and other glass areas contribute much to cold weather discomfort and fuel waste unless excessive heat loss is reduced by double glazing or storm sash.

Attention to the design and treatment of dead air spaces in the walls, with "fire-stopping" at top and bottom, is of great importance for comfort. Still air, whether trapped in the small cells of mass-type insulation, or retained in the space contiguous to reflective insulation, serves as a main retardant to heat flow.

Mass insulation can include almost any expanded or cellular material which contains a myriad of tiny air spaces to entrain air. While low conductivity of the material itself plays a part, the entrained air is the real insulating material. The densities of the various available materials are pretty closely alike. There can, therefore, never be justification for such claims as "one-half inch of our insulation is the equivalent of two inches of other makes."

Compressing insulating materials into rigid boards increases the density and makes the materials much less effective. "Insulating boards" are not really good insulation. Materials, such as rock wool or mineral wool, glass wool, and vermiculite, which cannot burn, absorb moisture, or attract vermin, are preferable to organic materials; the latter, such as hair felt and cork, are usually adequately treated, but are more likely to have to a degree some of the faults mentioned.

Reflective insulation (bright metal) works by actually turning back (reflecting) the heat, and not by impeding its flow as with mass insulation. Reflective insulation is thus usually considered better suited to keep out heat (summer), while mass insulation gives better protection against cold by keeping the heat in (winter). Reflective insulation made up from aluminum foil and paper in multiple layers with self-contained air spaces between several reflective surfaces functions about as satisfactorily as mass insulation when properly installed.

BREATHER TUBES

Practical experience with devices called wall breather tubes, miniature louvers, vapor vents, vent plugs, and dampness vents indicates that they are not effective to a significant degree in correcting a condition of cold-weather condensation within the walls of the house.

Air conditioning and ventilating

Room air conditioners • central air conditioning systems

mobile fans • ventilating fans

ROOM AIR CONDITIONERS

The basic functions of an air conditioner are cooling, dehumidification, circulation, and cleaning of the air. Unless a device accomplishes *all* of these processes, it is not an air conditioner and should not be referred to as such (see "Evaporative coolers," and "Imitation air conditioners," page 202).

Horsepower vs. Btu

A few years ago the capacity of a window air conditioner was judged by the size of the compressor it employed. A 1-ton model, for example, was expected to have a 1-horsepower compressor and a capacity for removing approximately 12,000 Btu of heat every hour. Today, principally because of the highly competitive nature of the business, and government policies in taxing air conditioners, there is no dependable correlation between the terms ton, horsepower, and Btu. Models are available, for example, which employ what are called 1-horsepower compressors but which vary in rated cooling capacity from 6300 to 14,000 Btu per hour.

Because the buyer is interested principally in the amount of *cooling* supplied, he should pay attention *only* to the Btu per hour figure given for cooling capacity. This figure is determined by a widely accepted test method which supplies a firm basis for judging relative cooling capacities of air conditioners. It should be noted that that rating is dependent upon the honesty of the manufacturer because the tests are made directly under his supervision. We are glad to be able to report, however, that Consumers' Research tests on the 1958 models indicate that published ratings are, with very few exceptions, sufficiently accurate to serve as satisfactory guides for buying.

It should be noted that, while some advertisements may not include the Btu capacity ratings, and salesmen in stores may be expected to continue use of the horsepower term, the Btu ratings should be available in *printed form* on request from any dealer deserving of consumers' confidence. (It would be unwise to rely on any mere verbal statements of capacity.)

What size to buy

There are several factors to be considered in determining the amount of cooling capacity required. Conditions that increase capacity requirements are humid weather, a sunny location with sunlight streaming through the window of a room, poor house construction, and lack of insulation in walls or ceiling (or roof). The circumstances involved in one's mode of living must also be considered since entertaining company, operation of appliances such as toasters, frying pans, ranges, refrigerators, washing machines, ultraviolet lamps, lights and frequent opening of doors, all increase the amount of heat that must be removed from a given space to keep it cool. As a very rough approximation, 15 Btu per hour of capacity for each square foot of floor space of the area to be cooled in a home will provide a satisfactory reduction in temperature. If temperatures normally encountered in hot summer weather are below 95 degrees, a lower figure may be used. If temperatures go much above 95 degrees, a higher figure for estimating needed capacity per square foot should be used.

The *apparent* capacity of a conditioner may be increased or a smaller Btu-per-cubic-foot figure used as a basis for selecting an air conditioner if the home is very well insulated, and windows are well shielded with awnings, or by another building. Good protection from the sun through the presence of shade trees and dense shrubbery is also helpful.

If you can use a yardstick or tape measure and are not balked by relatively simple multiplications—you will find it advantageous to write for a copy of ARI Standard 120-56 (available from the Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N.W., Washington 6, D. C., for 10 cents). This standard comprises a cooling load estimate form and the instructions for its use. Standard 120-56 provides a relatively easy method for calculating the required Btu per hour capacity of a conditioner needed for a particular location.

If you decide that a conditioner having a cooling capacity of 6000 Btu will be adequate, there is no need to buy and use one having a greater cooling capacity. Under most conditions, cost of operation goes up with the larger capacity, and a unit with more cooling capacity than needed will be more costly to install, and it may not provide as much actual comfort (because it will permit wider fluctuations in temperature and humidity).

Where the use of conditioners of 10,000 Btu or larger capacity is indicated, the dealer, or a qualified engineer, should be consulted for recommendations regarding capacity. The buyer should not rely on the room size in square feet as the basis for selection of conditioner capacity in such cases.

One of the normally useful functions of an air conditioner is removal of some of the moisture from the air in a room. It is likely that, if your conditioner has a two-speed fan motor, more moisture will be removed at the low speed. Note, however, that if a good part of the Btu capacity is utilized to remove moisture, then actual air *cooling* capacity will be lowered. You can't have high performance in both respects at the same time in one conditioner.

Electrical specifications

Room conditioners are commonly available for operation on alternating current at 60 cycles, 115 volts, 208 volts, and 230 volts, as ordered. Models with capacities higher than about 10,000 Btu are as a rule available only for operation on 208 volts or 230 volts. With a 208- or 230-volt conditioner, there is a higher inherent hazard of shock if some defect of insulation should develop.

The *ampere* figure given on the nameplate usually refers to the amount of electric current drawn by the conditioner when it is running. It gives an indication of the size of wire required for the branch circuit, and the ampere-rating of the fuse to be used for circuit protection. A "slow-blow" type fuse should be employed to allow for the high initial surge of current when the conditioner is turned on. Such a fuse will still "blow" and open the circuit if the current in amperes during regular running of the conditioner becomes higher than the branch circuit can carry safely.

The new portable conditioners

The new "plug-in" conditioners which weigh only 60 to 70 pounds and are rated at 7.5 amperes or less at 115 volts when running can be plugged into the usual branch-circuit outlet if the load on the circuit aside from the conditioner itself is small, for example, a small-wattage lamp or small radio. It should be noted, however, that some city electrical codes (New York City's for example) require that a separate branch circuit into which nothing else can be plugged should be used with any air conditioner. On the whole, this seems to be a wise precaution.

Air conditioners as heaters

Some models of window air conditioners are supplied with resistance heating elements which can be used to provide a little heat when the weather is chilly. It is expensive to supply heat by current through electrical resistance elements (see p. 184) and it is uneconomical over most of the U. S., except during mild weather when little heat is required. This year several manufacturers offer models of air conditioners which supply heat by using the "heat-pump" principle. In warm weather, heat is removed from the room air and transferred to the outside, where it is dissipated. In cool weather, when there is need for heat in the room, a valve operates automatically and changes the normal operation of a conditioner so that it becomes a heat supplier instead of a heat remover. With this method, the conditioner removes heat from the outside air and supplies that heat to the room. In general, heat pumps are not too satisfactory if the outside temperature drops below about 40°F.

Installation and service

It is highly important to have a definite *pre-purchase* understanding of the cost of installation and servicing and the terms of the guarantee. Electrical work (which may often be costly) should be fully considered, and included in all cost estimates. There should be no use of short cuts to reduce the outlay, for failure to provide adequately for any high electrical load may lead to a costly and dangerous fire.

The consumer should thoroughly understand any "guarantees" or "warranties" that are offered. Do they include free replacement of all defective parts and labor, or just cover the compressor? How long are they in effect? What service, if any, is included? Find out, before you buy, all that you can about your prospective air conditioner, in terms that can be directly compared as to functions performed, capacity, reliability of manufacturer and dealer, the amount of remodeling needed (extent of cutting up of partitions, etc., with in-the-wall mounting), cost of installation, availability and cost of repairs and service, and guarantee.

It will be wise to make certain, before buying, that there is a servicing organization for the brand in question in your area which has a reputation for providing good and rapid service. (Travel time of a serviceman can be very expensive.)

If an air conditioner is to function properly and last a reasonably long time, it must be regularly maintained and properly stored when not in use. Filters should be inspected at least once a month during periods of operation, and cleaned or replaced when necessary.

In the listings, models having a depth of less than 18 inches are indicated by a †. Unless otherwise indicated, prices given are approximate selling prices to consumers. Ratings are cr58.

A. RECOMMENDED

Admiral, Model 100L12 (Admiral Corp., Chicago 47) List, $310. Rated 115 volts, 12 amp., 8200 Btu per hr.† Controls were easy to use and well identified. Long-life filter, easily removed. The condenser did not have the protection against impact, which is desirable, to minimize damage if a child's ball or some other object should strike the condenser. General construction judged good. Efficiency in use of electricity, average. Noise during operation, moderate.

Airtemp, Model 1600-21-39 (Airtemp Div., Chrysler Corp., Dayton 1) No list price. Rated 115 volts, 12 amp., 9000 Btu per hr. Controls were easy to use and well identified. Disposable filter was easily removed. The condenser was not protected (see *Admiral*). General construction judged good. Efficiency in use of electricity, average. Noise during operation, moderate.

Amana, Model 100A2N (Amana Refrigeration, Inc., Amana, Iowa) $280. Rated 115 volts, 11 amp., 9000 Btu per hr. Controls were easy to use and satisfactorily identified. Electrostatic (long-life) filter, not readily replaceable. The condenser was protected, as is desirable. General construction judged good. Efficiency in use of electricity, average. Noise during operation, moderate.

Amana, Model 100C2N (Amana Refrigeration, Inc.) $250. Rated 115 volts, 12 amp., 8500 Btu per hr.† Controls were easy to use and well identified. Long-life plastic filter, not readily replaceable. The condenser was protected, as is desirable. General construction judged good. Efficiency in use of electricity was not measured but is estimated as average. Relatively quiet.

Amana, Model 100LC2N (Amana Refrigeration, Inc.) $180. Rated 115 volts, 7.5 amp., 6800 Btu per hr.† Similar to the *Amana 100C2N* and comments in that listing apply except that, with the *100LC2N*, efficiency in use of electricity was above average. The *100LC2N* was the only conditioner tested which did not have a thermostat, and inlet and exhaust air vents. Relatively quiet.

Fedders, Model 812SS-2 (Fedders-Quigan Corp., Maspeth, L.I., N.Y.) List, $320. Rated 115 volts, 7.5 amp., 9000 Btu per hr.† Controls were easy to use and well identified. Disposable-type filter, not readily replaceable. The condenser was protected, as is desirable. General construction judged good. Efficiency in use of electricity, highest of the conditioners tested. Moderately noisy.

Frigidaire, Model AI-100-58 (Frigidaire Div., General Motors Corp., Dayton 1, Ohio) List, $325. Rated 230 volts, 5.8 amp., 10,000 Btu per hr.† Controls were easy to use and well identified. Disposable filter, easy to replace. The condenser was protected. General construction judged good. Efficiency in use of electricity, average. Moderately noisy.

Welbilt, Model 8WJ2 (Welbilt Corp., Maspeth 78, L.I., N.Y.) List, $200. Rated 115 volts, 7.5 amp., 6300 Btu per hr.† Controls were easy to use and well identified. Long-life plastic filter, not easy to replace. The condenser was not protected. General construction judged good; the unit was very compact and light in weight (only 125 lb.). Efficiency in use of electricity was not measured, but is estimated as average. Moderately noisy.

Welbilt, Model 8W02 (Welbilt Corp.) List, $230. Rated 115 volts, 7.5 amp., 8800 Btu per hr.† Controls were easy to use and satisfactorily identified. Long-life plastic filter, easy to replace. Condenser not protected. General construction judged satisfactory. Efficiency in use of electricity, above average. Moderately noisy.

B. INTERMEDIATE

Coolerator, Model C10A2 (Lonergan Coolerator Div., McGraw-Edison Co., Albion, Mich.) List, $380. Rated 230 volts, 8 amp., 9900 Btu per hr.† Controls were easy to use and well identified. The filter was not easy to replace. Condenser was not protected. General construction judged average. Efficiency in use of electricity, below average. Moderately noisy.

Gibson, Model 1-5812 (Gibson Refrigerating Co., Div. of Hupp Corp., Greenville, Mich.) No list. Rated 230 volts, 8 amp., 10,700 Btu per hr. Controls were satisfactory. Legibility of markings, good. Long-life filter, not easy to replace. Condenser not protected. General construction judged only fair. Efficiency in use of electricity, average. Relatively noisy.

Mathes, Model 142C (The Mathes Co., Fort Worth 5, Tex.) $300. Rated 230 volts, 8.2 amp., 14,000 Btu per hr. Controls operated satisfactorily and were well identified. Long-life filter, not easy to replace. Condenser was protected. General construction judged satisfactory. Compared with some others, this unit was inefficient in use of electricity. Moderately noisy.

RCA Whirlpool, Model I-8100-2 (Whirlpool Corp., St. Joseph, Mich.) No list price. Rated 115 volts, 12 amp., 9850 Btu per hr. Controls were satisfactory, but were poorly identified and seemed unnecessarily complicated. Long-life aluminum filter, not easy to replace. Condenser was protected. Construction was judged average. Efficiency in use of electricity, slightly above average. Relatively noisy.

Vornado, Model D100D-1 (The A. O. Sutton Corp., Inc., Wichita 1, Kans.) No list. Rated 115 volts, 12 amp., 9800 Btu per hr.† Controls were satisfactory and well identified. Disposable filter, easily removed; it had the disadvantage that any dust or dirt collected was in plain sight in the room. Condenser, not protected. General construction judged satisfactory. Efficiency in use of electricity, average. Relatively noisy.

Welbilt, Model 8WU2 (Welbilt Corp.) List, $270. Rated 115 volts, 12 amp., 11,500 Btu per hr.† Similar to the *Welbilt 8W02* in size, and comments regarding the *8W02* apply except that efficiency in use of electricity was only average. Relatively noisy.

▶ **REF:** Bulletin, June '58.+++

CENTRAL AIR CONDITIONING SYSTEMS

While complete home air conditioning installations are coming into wide use—7 percent of the 980,000 homes started in 1957 had them—they are not without some disadvantages which tend to offset partially their rather obvious advantages. In many cities, it has been necessary to curtail use of city water as a cooling medium in central systems. In Charlottesville, Va., for example, systems which use more than 7 gallons of water per minute are required by city ordinance to use equipment for conserving water. A small central home conditioning system can be installed for about half the cost of a new *Ford* or *Chevrolet* automobile (about $500 to $600 per ton installed). Unlike the new car, it will improve the property value, and for a long time, for it has an expected life, before replacement, of about 20 years. It has been found that cleaning and painting expenses are much reduced in homes equipped with air conditioning. There are certain other less obvious benefits. Dining out, for example, will be less frequent because it is so comfortable at home on a hot day. At the same time, some users complain of noise, and many feel the need for fresh outside air, even if the outside air is hot.

A report on a widely publicized research village (22 air-conditioned homes) at Austin, Tex., showed that air conditioning was liked by most of the project residents. There were, however, many points of dissatisfaction. The year's total operating cost for the Austin homes, which had been estimated as $100, ranged between $120 and $270. Dealer services were considered expensive and unsatisfactory, possibly because servicemen were not well versed in carrying out needed repairs and servicing.

The units listed are models with 15,000 to 110,000 Btu per hour (1½ to 7½ hp.) capacities. They are usually intended for cellar or attic installation, depending upon the model. Some models listed combine heating with air conditioning.

Air-O-Matic (Williams Oil-O-Matic Heating Co., Div. Nat. Union Electric Corp., Columbus 8, Ohio) 2, 3, and 5 hp. Air cooled. Attic models available.

Airtemp (Airtemp Div., Chrysler Corp., 1600 Webster, Dayton, Ohio) Air-cooled models are offered in 2 and 3 hp. sizes only. Water-cooled models are available in 2, 3, and 5 hp. separate units, or as integrated with oil- or gas-fired furnaces.

American-Standard (American-Standard Air Conditioning Div., Elyria, Ohio) Oil- or gas-fired summer-winter units. 53,000 to 106,000 Btu (bonnet) with gas; 72,000 to 95,000 Btu (bonnet) with oil. Cooling, 2 and 3 hp., air or water cooled.

Delco (Delco Appliance Div., General Motors Corp., Rochester 1, N.Y.) Integrated summer-winter unit. 75,000 Btu heating (bonnet); 3 hp. cooling. Gas or oil. Water cooled. Also 2, 3, and 5 hp. Air cooled.

General Electric (General Electric Co., Bloomfield, N.J.) Wide selection, both air- and water-cooled models. 1½ to 7½ hp. Also summer-winter models, 48,000 to 168,000 Btu, heating with either gas or oil.

Heil (The Heil Co., 3000 W. Montand, Milwaukee 1) 2 and 3 hp. Water cooled. Several arrangements of cabinets and mountings.

Iron Fireman (Iron Fireman Mfg. Co., 3170 W. 106, Cleveland 11) 2, 3, and 4 hp. Air cooled.

Luxaire (C. A. Olsen Mfg. Co., Elyria, Ohio) Oil- or gas-fired summer-winter units. 80,000 to 140,000 Btu (bonnet) with gas, or 84,000 to 140,000 with oil; cooling, 2, 3, and 5 hp. Air or water cooled. Also separate air conditioning units, 2, 3, and 5 hp. Air cooled.

Mor-Sun (Morrison Steel Products Co., 601 Amherst, Buffalo 7) 2, 3, 4, and 5 hp. Air cooled or water cooled.

Weathermaker (Carrier Corp., 300 S. Geddes, Syracuse) Oil- or gas-fired summer-winter units. 60,000 to 160,000 Btu (bonnet) with gas, or 84,000 to 185,000 Btu (bonnet) with oil. 1.8 to 4.9 tons cooling capacity. 1.8 to 6.2 tons, air cooled. Heating coils, optional.

Westinghouse (Westinghouse Electric Co., Staunton, Va.) Various types. Water and air cooled. 15,000 to 110,000 Btu. Includes integrated oil- and gas-fired models, as well as conversion for existing heating equipment, and window models.

▶ **REF:** Bulletin, Mar. '55+++, Apr. '55+++.

EVAPORATIVE COOLERS

There is also available a type of room-cooling device which is dependent upon the cooling effect of the evaporation of water for its operation. Evaporative coolers, as they are called, are effective only in very dry climates as found in Texas, Arizona, and in some other areas where a combination of very high temperature *and low humidity* is common. They produce a cooling effect, but do so only at the expense of an increase in the humidity, which is sometimes disadvantageous. Practically, you will throw your money away if you buy this type of cooler and expect it to work satisfactorily in the sort of climate in which the great majority of Americans live, on days when it is both hot and humid.

One easy method of distinguishing between a cooler and a conditioner lies in the fact that a true air conditioner uses a considerable amount of electricity while running. Even a small compact conditioner, rated at 7.5 amperes at 115 volts, will consume over 800 watts. The imitation air conditioner, on the other hand, will use only 1 or 2 amperes, or about 200 watts, and will not cause the lights to blink, when it goes on.

IMITATION AIR CONDITIONERS

Many so-called air conditioners, air coolers, climatizers, and air purifiers which are widely promoted at very attractive prices consist merely of an enclosure in which one will find a small fan or two, a filter, possibly a germicidal lamp, or a flat pan or container which must be kept filled with some ice from the refrigerator. Such a device or any combination of these elements cannot truthfully be called an air conditioner and cannot possibly function as one.

C. NOT RECOMMENDED

Weatherzone Portable Air Climatizer (Comfortzone Corp., 22 Jericho Turnpike, Mineola, L. I., N. Y.) A fan arrangement sucking air over a water-filled pan and discharging it into the room; this device was advertised in terms that made it seem a true air conditioner.

FANS FOR SUMMER COOLING

The many electric fans available can be classed roughly in two groups—circulating and ventilating. A circulating fan is designed primarily to keep the air within a room in constant motion. A ventilating fan is designed to remove air from the room, replacing it with fresh air from outside the room. With either kind, the air movement makes you feel cool because it promotes more rapid evaporation of perspiration from the skin, the body's way of cooling in hot weather.

A fan does *not* cool the air in a room. To cool the air, it is necessary to employ an air conditioner or replace the warm air in the room with cooler air from out of doors or from the basement. A *ventilating* fan is the preferred type to bring cool air into the house, where there is a supply of cool outside air available.

Fortunately, in most areas of the country, the outdoor temperature drops considerably at night, often 10 to 20 degrees or more. If the cool outside air is drawn into the house to carry off the heat in walls, ceilings, and furnishings, and the warm inside air is pushed outdoors, the air change can make a home fairly comfortable for sleeping.

A portable fan or a mobile fan mounted on a stand with wheels offers an excellent compromise for all-around use in hot weather. During the warm daylight hours, the fan can be used in any part of the home as an air circulator. During night hours, it can be placed in front of a window and used as a ventilating fan to bring in the cooler outdoor air (but one should not sit or sleep in the direct draft produced by a fixed fan).

For a satisfactory cooling effect, the air-moving capacity of the fan should be sufficient to produce a complete air change in a room in 1½ minutes in the northern states and in 1 minute in southern regions.

There are a few simple rules that should be followed to get the best ventilating effect from a portable or mobile fan.

1. Open only the window at which the fan is placed and the windows farthest from the fan in the rooms you desire to cool. This is to provide the longest possible path for the cool air moving toward the fan.

2. It may be well to close the windows in unoccupied rooms to obtain better air movement and cooling effect in the other rooms.

3. Turn on the fan in the evening as soon as the outside temperature has dropped 2 or 3 degrees below the temperature indoors.

4. To obtain the maximum cooling effect and to start off the next day with a cool house, operate the fan all night.

5. The fan should be positioned about 3 feet from and directly in front of an open window, so that it blows the air in the room *out* through the window. The fan should be placed so that it operates with the prevailing breeze; thus if the wind usually blows from the south, mount

the fan, blowing out, in front of a north window.

6. Keep the screen clean on the window at which the fan is located. Even a clean screen cuts down air flow somewhat, while a dirty or clogged screen may make the fan ineffective.

The fans tested were all so-called "mobile" models with 20-inch blades, except the *Westinghouse* which had 17-inch blades. In some instances, a manufacturer will supply the same fan with the same performance capabilities in two or three different models, portable or mobile, or for window use.

Mobile circulating fans

A. RECOMMENDED

Kenmore Roll-about, Model 480-8068-0 (Sears-Roebuck's Cat. No. 8077) $56.50, plus shipping charges. Stable, relatively quiet, and above average in air-moving capabilities. ¶Portable window fan Cat. No. 9361, at $40, appears to be similar.

Westinghouse Mobilaire, Model MA-4020 (Westinghouse Electric Corp., Springfield 2, Mass.) $80. 17-in. blade. Stable, relatively quiet, above average in air-moving capabilities, and ruggedly constructed. It was possible for a child to insert his fingers between the air-directing cones, so as to come into contact with the blades, a dangerous hazard. The user should take precautions to prevent the appliance cord from falling in this space; if it should catch here, the result might be a fire and shock hazard. Excellent instruction book. ¶*Model 4021,* at $70, appears to be almost identical.

B. INTERMEDIATE

Montgomery Ward Automatic Rollabout, Model VSR-2466A (Montgomery Ward's Cat. No. 2460R) $57.50, plus shipping. The fan was very satisfactory, but the stand was unstable and difficult to adjust in height. ¶Portable fan Cat. No. 2466 MO, at $45, is identical and merits an *A-Recommended* rating.

Signal, Model RS-20 (Signal Electric Div., King-Seeley Corp., Menominee, Mich.) $77.50. The fan was very satisfactory, but the stand was less stable than some others. ¶Portable model, at $57.50, merits an *A-Recommended* rating.

C. NOT RECOMMENDED

Bob Irwin, Cat. No. 7-328 (Kemco Industries, St. Louis 16) $50.

General Electric, Model P-2 (General Electric Co., Bridgeport 2, Conn.) $50.

▶ **REF:** Bulletin, July '57.+++

Built-in window ventilating fans

A. RECOMMENDED

Emerson, Cat. No. 76310-R-3 (The Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21) $85. Well-constructed fan, excellent air-moving capacity, and above-average efficiency.

* * *

The following were considered not quite equal to the above in one or more respects.

Diehl, Cat. No. B20WP16 (Diehl Mfg. Co., Somerville, N.J.) $69. High efficiency. Good air-moving capacity. Because of insufficient guarding of the blades this fan is considered undesirable for use in homes with young children. ¶Current *Model D20WP16,* at $55, appears to be similar.

General Electric, Cat. No. T2 (General Electric Co., Bridgeport, Conn.) $65. Twin 12-in. fan of average efficiency. Portable. Can be used in suitably sized casement windows. ¶Current *Model T3,* at $60, appears to be similar.

General Electric, Cat. No. W1 (General Electric Co.) $70. Average efficiency. Average air-moving capacity. Portable. ¶Current *Model W4,* at $70, appears to be similar.

Westinghouse, Cat. No. WF-2520 (Westinghouse Electric Corp., Springfield 2, Mass.) $70. Average efficiency. Good air-moving capacity.

C. NOT RECOMMENDED

Dominion, Model 2050 (Dominion Electric Corp., Mansfield, Ohio) $19.

▶ **REF:** Bulletin, June '55.+++

KITCHEN VENTILATING FANS

The only really effective location for a kitchen fan is in the wall at the rear of and above the range. A wall fan discharging directly to the outdoors is preferred. Safety against interfering with burner flames requires that it should be located at least 3 feet above a gas range top. Ceiling fans, while effective, are apt to be neglected. When ducts through the wall or ceiling are used, there is an increased hazard of fire due to grease which almost inevitably accumulates in the duct. The rated capacity of a kitchen fan should be sufficient to change the air in the kitchen completely at least four times an hour; this will usually call for a motor of 1/6 horsepower or more. (Bargain-price kitchen fans often have motors too small to be of much use.)

Textiles, clothing, and shoes

SHEETS

Most sheets are made of cotton percale or muslin. The type designations found on some sheet labels (such as Type 112, 128, 140, 180, or 200) refer to the minimum number of threads per square inch (warp threads plus filling threads). Sheets having 180 to 200 threads per square inch are called percale. Generally, sheets with 140 threads per square inch are the strongest. Both colored and white sheets are likely to be fully satisfactory in use. In an investigation reported by the American Hotel Association, it was found that colored linens are practical for use in hotels and that no special laundering care had to be given them.

Sheets for adults' beds come in two lengths, 99 inches and 108 inches. The longer sheets allow for more tuck-in and more foldover at the top to protect the bindings on blankets from soil and wear. Sheets in either length come in several widths: 81 or 90 inches wide for a double bed, 72 inches for a single bed, and 63 inches for a twin bed. For extra-long or extra-wide beds, larger sheets are available.

Cotton sheets may shrink as much as 5 percent in length, a shortening of a little more than 5 inches on a 108-inch sheet. Fitted sheets, CR finds, are made of preshrunk fabrics. In the last study, fitted sheets shrank 2 percent or less, which corresponds to less than 2 inches in the length of a fitted bottom sheet.

Nylon sheets will likely have minimum shrinkage. These sheets are high priced and cost from $7 to $9 a sheet—two to three times as much as a satisfactory muslin sheet. Some people like their silky "feel" and their appearance. Others object to the lack of crispness. It is not advisable to use nylon sheets for both top and bottom sheets at one time, for the covers will tend to slide off the bed.

Many laundries make an extra charge of 5 cents to 20 cents for laundering a fitted sheet, but others do not charge extra.

The cotton and nylon sheets listed are all fitted sheets. All of the cotton sheets met requirements with respect to minimum breaking strength and maximum sizing. There were differences in strengths of the fabrics, however, and in general the stronger sheets were judged superior by CR because they could be expected better to withstand repeated laundering.

Fitted muslin and percale sheets

A. RECOMMENDED

The first two sheets were the strongest.

Springmaid Sumter (Spring Mills, 200 Church, New York 13) $2.79. Total thread count, 156. 2

Wamsutta Supercale (Wamsutta Mills, New Bedford, Mass.) $6.95. Total thread count, 220. 3

* * *

Pacific Truth Muslin (Pacific Mills, 1407 Broadway, New York 18) $2.49. Total thread count, 136. 1

Lady Pepperell Combed Percale (Montgomery Ward's Cat. No. 16—3345; Pepperell Mfg. Co.) 2 for $5.48, plus postage. Reversible. Total thread count, 200. 2

Pacific Extra Strength Muslin (Pacific Mills) $2.98. Total thread count, 156. 2

Pacific Combed Percale (Pacific Mills) $3.49. Total thread count, 196. 2

Pequot Plus-Service (Naumkeag Steam Cotton Co., Pequot Mills, Salem, Mass.) $2.98. Total thread count, 148. One sheet in package was marked *"Salem."* 2

Springcale Combed Percale (Spring Mills) $3.19. Total thread count, 192. 2

B. INTERMEDIATE

All the following sheets met the requirements for their types, but the average breaking strengths were less than 70 lb. per inch.

Cannon Muslin (Cannon Mills, Inc., New York 13) $2.19. Total thread count, 132. 1

Spring Knight (Spring Mills) $2.49. Total thread count, 140. 1

Cannon Combspun Percale (Cannon Mills, Inc.) $2.89. Total thread count, 196. 2

Pequot, Type 180 (Naumkeag Steam Cotton Co.) $3.49. Total thread count, 192. 2

Fitted nylon sheets

A. RECOMMENDED

Cannon Nylon Tricot (Cannon Mills, Inc.) $6.95. 2

Pepperell Peeress Nylon Snug Fit (Pepperell Mfg. Co.) $7.50. A woven nylon sheet. Reversible. 2

Glen Raven (Nylon Tricot) Fashioned-Fitted (Glen Raven Knitting Mills, 265 Madison Ave., N.Y.C.) $8.95. 3

Matouk (John Matouk & Co., 1 W. 37 St., New York 18) $13.95 top sheet; $10.95 bottom sheet. Nylon crepe. 3

▶ **REF:** Bulletin, Feb. '54.++

PILLOWCASES

Pillowcases should be selected to fit the pillow neatly but not too closely. Sizes vary, and the usual sizes are 42 x 36, 42 x 38½, and 45 x 38½. A good rule is to measure the width of your pillow, double the measurement, and add 2 or 3 inches. For example, for a pillow 20 x 26 inches get a 42-inch case, for 22 x 30 inches a 45-inch case.

Pillowcases are made of the same fabrics as sheets—percale, muslin, and nylon. The nylon pillowcases have the disadvantage that the pillows will tend to slide off the bed if nylon pillowcases are used with a nylon bottom sheet.

BLANKETS

Blankets nowadays are made of wool, cotton, rayon, or various combinations of these three fibers, and also of *Orlon*, *Acrilan*, and *Dynel* acrylic fibers. These last three synthetics can be given a good nap, and the fibers are generally strong and mothproof. Blankets made of the synthetic fibers vary in quality just as wool and cotton blankets do. Since the acrylic fibers are smooth, the blanket will fluff or fuzz off easily if it has been improperly napped. Check by rubbing lightly a small corner of the blanket; if the nap rubs off easily in your hands, it will also rub off in general use and in laundering.

The basic weave of a blanket should be tight and firm, and the nap should support the weight of the blanket and not pull out, regardless of the fiber of which the blanket is made.

Blankets are finished with stitching, or cotton, acetate, or nylon bindings. The bindings should be eased onto the blanket and should be attached with two or three rows of stitches. Some blankets are made with fitted corners as on fitted sheets. Buy blankets as long as the length of the mattress plus the thickness of the mattress with an allowance of six inches or more for tucking in. In figuring needed *width*, add the mattress thickness and tucking allowance twice.

The warmth of a blanket is largely determined by its thickness and its nap, not by its weight or fiber content. Since thickness has a lot to do with warmth, down puffs are preferred to blankets by many people since they are light in weight as well as warm.

Electric blankets

Electric blankets are a favorite method of keeping warm for chilly consumers who need extra heat but do not like the weight of wool blankets and for some reason do not care for down puffs.

The principal disadvantage of electric blankets is that they are relatively short lived both as compared to other blankets and also as compared to other electrical appliances in the home.

To get the best service from an electric bed covering, avoid folding or bunching it in use. It is probably best also not to sit or lie on it, as the fine wiring can be pulled out of its connectors in the blanket or possibly be broken.

It is common for electric blanket manufacturers to offer an exchange deal on a defective blanket that has been used longer than its guarantee period. The labor and time to repair an inoperative blanket can sometimes amount to more than the exchange price. Charges for exchanging a new blanket for the old range from $15 to $18.

Since service for defective electric blankets may be very slow and the charge will likely run to a substantial amount of money, Consumers' Research recommends that no blanket be purchased unless it has a two or three year guarantee.

It is estimated that, in an average climate, electricity to operate an electric blanket would cost from $1 to $1.50 a month.

An electric sheet has the same type of wiring as an electric blanket, but it is made of cotton fabric and is designed to be used between the regular sheet and the top cover of the bed. Electric sheets are about one third cheaper than electric blankets. In many climates it would be necessary to use a regular blanket along with the electric sheet in order to get the needed degree of warmth.

Do not purchase any electric blanket unless it carries the *UL* label, which indicates that the blanket was checked for design and showed satisfactory evidence that it would not be likely to cause a fire in use. Electric blankets do occasionally cause fires, which may easily have a fatal result.

All the blankets listed passed CR's tests for electric leakage (see "Safety in the home," pages 94 and 96).

B. INTERMEDIATE

Northern, Model 991 (Northern Electric Co., Chicago) $34.95. Nylon, rayon, cotton. Size, 72 x 84 in. Dimensions of heated area, 54 x 68 in. Weight, 4 lb. 14 oz. 2

Philco Comfortemp, Model 100 (Philco Corp., Beacon, N.Y.) $37.95. Rayon, nylon, cotton. 70 x 84 in.; heated area, 54 x 66 in. Weight, 4 lb. 14 oz. ¶*Model 110C,* at $29.95, is thought to be similar. 2

Sunbeam, Model SDB (Sunbeam Corp., 5600 Roosevelt Rd., Chicago 50) $34.95. 25% wool, 50% rayon, 25% cotton. 73 x 85 in.; heated area, 54 x 68 in. Weight, 4 lb. 10 oz. 2

Westinghouse, Model B-551 (Westinghouse Electric Corp., Mansfield, Ohio) $39.95. Nylon blend. 73 x 85 in.; heated area, 55 x 69 in. Weight, 5 lb. 3 oz. ¶*Model EB 561,* at $34.95, is thought to be similar. 2

▶ **REF:** BULLETIN, Nov. '55.+++

BATH TOWELS

Terry cloth, of which most bath towels are made, has some of the threads in the weave pulled out to form the loops of the pile. This pile adds absorbing material without increasing the size or stiffness of the towel. A towel made of plain woven fabric of the same weight and size would absorb just as much water as a terry cloth towel (although a little more slowly), but it would feel rough and stiff by comparison with the terry material.

The terry towels included in the study reported recently ranged in price from 59 cents to $5.95 per towel—prices which amounted to less than $1 to $6.72 per square yard. The lightweight towels ranged in price from 79 cents to $2.33 a square yard, medium weight from $1.08 to $2.64, heavyweight from $1.31 to $6.72. Thus weight alone did not determine the price bracket.

The towels were blue, blue-green, or blue-and-white striped and ranged in weight from 8 ounces per square yard to 16.7 ounces per square yard. For convenience, they are classified by weight as light (8 to 11.3 ounces per square yard), medium (11.7 to 13.9 ounces per square yard), and heavy (14.3 to 16.7 ounces per square yard). While low weight per square yard was associated with relatively low breaking strength, some lightweight towels met or exceeded the minimum requirements (ASA L24.2.5-1955) of 50 pounds breaking strength in the length direction and 40 pounds in the width. In general, medium-weight towels were stronger than towels of other weights.

The towels were all "bath size," nominally 20 x 40 inches, 22 x 44 inches, 24 x 46 inches, or 24 x 48 inches in size. Most of the towels were as large as claimed, within reasonable tolerances.

Most of the lightweight and medium-weight towels absorbed moisture at a faster rate than the heavier towels. Some absorbed water slowly, and two lightweight striped towels showed higher rates of absorption in the color stripes than in the white areas.

The heavier towels absorbed larger amounts of water both in grams and on a percentage-of-towel-weight basis. There were, however, towels in all three weight groups that absorbed better than 100 percent of their weight within 10 minutes.

The towels tested had shrunk in length by 6 to 11½ percent after five launderings in an automatic washer-and-dryer combination. In most cases, the shrinkage was not enough to make the towels shorter or narrower than the nominal or marked size. Seven of the towels tested had borders which shrank and caused distortion of the towel.

Prices in parentheses are the prices of the towels per square yard, based on nominal or marked size.

A. RECOMMENDED

LIGHTWEIGHT TOWELS

Cannon (J. C. Penney Lot No. 40-7789) 49c (79c) 9.6 oz. per square yard.

Cannon Balboa (Cannon Mills, 70 Worth St., New York 13) 59c (96c). 8.0 oz. per sq. yd.

Dundee Duet (Dundee Mills, Inc., 40 Worth St., New York 13) 89c ($1.04). 10.7 oz.

MEDIUM-WEIGHT TOWELS

Callaway Citation (Callaway Mills, Inc., 295 Fifth Ave., New York 16) $1.59 ($2.13). 11.8 oz.

Callaway Minuet (Callaway Mills, Inc.) $1.59 ($2.13). 11.7 oz.

Callaway Royalty (Callaway Mills, Inc.) $1.98 ($2.23). 13.4 oz.

Cannon Empress (Cannon Mills, Inc.) $1.89 ($2.04). 13.4 oz.

Dundee Chantilly (Dundee Mills, Inc.) $1.49 ($1.75). 13.9 oz.

Dundee Olympic (Dundee Mills, Inc.) $1 ($1.12). 12.1 oz.

Fieldcrest Allegro (Fieldcrest Mills, Inc., 88 Worth St., New York 13) $1.98 ($2.23). 13.9 oz.

Harmony House (Sears-Roebuck's Cat. No. 3380RM) 91c ($1.08), plus postage. 12.8 oz. Short.

HEAVYWEIGHT TOWELS

Cannon (J. C. Penney Lot No. 40-7882) 98c ($1.31). 14.4 oz.

Cannon Radiance (Cannon Mills, Inc.) $1.99 ($2.34). 14.3 oz.

Fieldcrest Monaco (Fieldcrest Mills, Inc.) $1.98 ($2.33). 14.6 oz.

Fieldcrest Royal Velvet (Fieldcrest Mills, Inc.) $3.98 ($4.48). 16.6 oz.

Martex Luxor 1960 (Martex Mills, 65 Worth St., New York 13) $3.75 ($4.22). 14.7 oz.

Martex Midas Touch (Martex Mills) $2.98 ($3.50). 14.8 oz.

B. INTERMEDIATE

LIGHTWEIGHT TOWELS

Callaway Coachman (Callaway Mills, Inc.) $1.98 ($2.33). 11.3 oz. Absorbency, relatively low.

Cannon Allegro (Cannon Mills, Inc.) 79c ($1.06). 10.8 oz. A good towel, but smaller than marked size in both directions. Decorative border shrank more than one inch in excess of width of towel.

Cannon Starlite (Cannon Mills, Inc.) 79c ($1.06). 11.1 oz. Absorbency, relatively low.

Dundee Regency (Dundee Mills, Inc.) $1.19 ($1.40). 11.3 oz. Border shrank excessively.

MEDIUM-WEIGHT TOWELS

Callaway Sun Valley (Callaway Mills, Inc.) $1.98 ($2.23). 13.2 oz. Absorption speed, relatively slow.

Cannon Ascot Stripe (Cannon Mills, Inc.) $1.29 ($1.73). 13.2 oz. Short. Absorption speed, relatively slow.

Cannon Kimberly (Cannon Mills, Inc.) 96c ($1.28). 11.7 oz. Border shrank excessively.

Cannon Moroccan Stripe (Cannon Mills, Inc.) 99c ($1.33). 12.9 oz. Short. Absorption speed, relatively slow.

Cannon Spencerian (Cannon Mills, Inc.) $2.25 ($2.64). 12.8 oz. Absorbency, relatively low.

Cone, Style 9164-3 (Cone Mills, Inc., 1440 Broadway, New York 18) 98c ($1.31). 12.2 oz. Border shrank excessively.

Martex Kensington (Martex Mills) $1.59 ($1.87). 13.5 oz. Border shrank excessively.

Martex Windsor (Martex Mills) $1.59 ($1.87). 12.8 oz. Border shrank excessively.

HEAVYWEIGHT TOWELS

Callaway Grandeur (Callaway Mills, Inc.) $2.98 ($3.35). 15.2 oz. Absorption speed, relatively slow.

Callaway Penthouse (Callaway Mills, Inc.) $3.98 ($4.46). 16.7 oz. Absorption speed, relatively slow.

Martex Patrician (Martex Mills) $5.95 ($6.72). 16.0 oz. Absorption speed, relatively slow.

Martex Sovereign (Martex Mills) $1.95 ($1.79). 14.6 oz. Border shrank excessively.

C. NOT RECOMMENDED

LIGHTWEIGHT TOWELS

Cannon (J. C. Penney Lot No. 40-4566) 59c (96c). 9.9 oz. Breaking strength too low.

Cannon Piccadilly (Cannon Mills, Inc.) 59c (96c). 10.3 oz. Breaking strength too low. Speed of absorption, relatively slow.

Cone, Style 9099A (Cone Mills, Inc.) 59c (79c). 9.5 oz. Breaking strength too low.

Dundee Stardust (Dundee Mills, Inc.) 69c (93c). 8.8 oz. Breaking strength too low.

MEDIUM-WEIGHT TOWELS

Callaway Lynn (Callaway Mills, Inc.) $1.59 ($1.86). 12.4 oz. Absorbency, low. Absorption speed, relatively slow.

Cannon Luxury Stripe (Cannon Mills, Inc.) 98c ($1.31). 12.1 oz. Absorbency, low. Absorption speed, relatively slow.

▶ **REF:** Bulletin, Jan. '58.+++

KITCHEN TOWELS

A dish towel should be soft and flexible for easy handling and should not leave objectionable lint.

Dish towels made of linen, cotton, cotton-linen, and rayon-cotton-linen fiber mixtures all absorbed moisture at about the same rate and were about equally good with respect to not leaving lint, in a Consumers' Research study.

Dish towels should be 28 inches in length or longer in order to be usable to wipe the inside and outside of a glass at the same time and still cover the hand so that no fingerprints are left. Ratings are cr53.

A. RECOMMENDED

Morgan-Jones (Morgan-Jones, Inc., 58 Worth, New York 13) 35c. Cotton. 1

Startex (Startex Mills, Startex, S. C.) 39c. 65% cotton and 35% linen. 2

Stevens (Stevens Linen Associates, Inc., 40 Worth, New York 13) 39c. Linen with cotton border. 2

Webb's Towel (Webb Co. Linens, 51 White, New York 10; made in Ireland) 79c. Linen with cotton border. 3

B. INTERMEDIATE

The first three towels listed were considered a little stiff in use; they were satisfactory in other respects.

Cannon (Cannon Mills, 70 Worth, New York 13) 29c. Cotton. 1

Stevens Sunshine Towel (Stevens Linen Associates, Inc.) 35c. 46% cotton and 54% linen. 1

Cannon Rapidry (Cannon Mills) 39c. Cotton 2

* * *

Leacock (Leacock Inc., 230 Fifth Ave., New York 16) $1. Linen. Not colorfast to commercial laundering. 3

Martex Dry-Me-Dry, Style 1556 (Wellington Sears Co., 65 Worth, New York 13) 59c. Cotton, rayon, and linen. Shrinkage, highest of all woven towels tested. 3

Wilendur (Distributed by H. Leh & Co., Allentown, Pa.) 69c. Cotton. 3

▶ **REF:** Bulletin, Mar. '53.++

* * *

Non-woven towels are especially useful for drying jobs that would soil a cloth badly. They are stiff when dry but become pliable when damp. They are not durable, however, and leave lint on glasses after a short period of use.

B. INTERMEDIATE

Rainbow Towels (Unique Products, Inc., St. Petersburg, Fla.) 6 for $1. Non-woven "plastic rayon."

▶ **REF:** Bulletin, Mar. '53.++

WHITE COTTON SHIRTS

A "business" shirt or "dress" shirt, as it is also called, is marked with collar size and also with sleeve length. These are indicated as 15-34, for example, or perhaps 15-4, stamped inside the collarband. The 15 is the neck size; 34 is the sleeve length measured from the center of the back of the neck to the end of the shirt-sleeve cuff.

While most shirts are correctly sized as to collar size and sleeve length, they do not conform to the size requirements of the Commercial Standard for Men's Shirt Sizes in the five body dimensions that are important for both comfort and appearance of a shirt. In the latest study by Consumers' Research, which included 15 brands, the sizes of only two shirts tested, the *Pilgrim De Luxe* and the *Hathaway*, conformed to the Commercial Standard in all five body measurements.

The most popular fabric in men's dress shirts is broadcloth. This is a smooth, clean looking, strong cotton fabric that has a lustrous and attractive appearance. All the shirts in the study reported were made of broadcloth. All had fused collars except as noted.

A. RECOMMENDED

Pilgrim De Luxe (Sears-Roebuck's Cat. No. 33—315) $3.62, plus postage. AA2

Penney's Towncraft, Kingroyal Style (J. C. Penney Co., 330 W. 34, N.Y.C.) $2.98. 1

Pilgrim (Sears-Roebuck's Cat. No. 33—301) $2.83, plus postage. 1

Brent 4-Star De Luxe (Montgomery Ward's Cat. No. 35—630) $3.98, plus postage. 2

Manhattan, Span (Manhattan Shirt Co., 444 Madison Ave., New York 22) $3.95. 2

Arrow, Dale (Cluett, Peabody & Co., Inc., 10 E. 40, N.Y.C.) $5. 3

Hathaway (C. F. Hathaway Co., Waterville, Me.) $5.95. Soft collar with stays. 3

B. INTERMEDIATE

Brent 3-Star (Montgomery Ward's Cat. No. 35—676) $2.98, plus postage. 1

Jayson, Adonic Jay-Fern (F. Jacobson & Sons, Inc., 1115 Broadway, New York 10) $2.95. 1

Longwear (New Process Co., Warren, Pa.) $2.59. 1

TruVal, Paragon Prime (TruVal Mfrs., Inc., Publix Shirt Corp., 281 Fifth Ave., New York 16) $2.95. 1

Arrow, Dart (Cluett, Peabody & Co., Inc.) $3.95. 2

Van Heusen, Century 100 (Phillips-Jones Corp., 417 Fifth Ave., N.Y.C.) $3.95. Three-ply woven collar. 2

C. NOT RECOMMENDED

Bond, Style Manor Supreme (Bond Clothing Stores, Fifth Ave. and 35, New York 1) $2.98. 1

Wings, Rocket (Wings Shirts, 4 W. 33, N.Y.C.) $2.95. 1

▶ **REF:** Bulletin, Jan. '55.+++

WASH-AND-WEAR SHIRTS

The resin-treated cotton wash-and-wear shirt is a comparative newcomer to the "wash-and-wear" field, although "no-iron" shirts made of synthetic fibers or blends of *Dacron* and cotton have been on the market for some time. All wash-and-wear shirts are considerably higher in price than conventional cotton dress shirts.

There is considerable controversy over the accuracy of the labeling of "wash-and-wear" and "no-iron." Both the resin-treated cotton shirts and the *Dacron*-and-cotton shirts require special care in laundering, if the "no-ironing" feature is to be realized in practice. Both kinds should be washed by hand, or in a washer with the extraction or spin-dry cycle omitted, and then allowed to drip dry. They may be worn without ironing, or with a little touch-up pressing, depending on the preference of the wearer. Men who are particular are likely to want their shirts touched up, specially the collar, cuffs, pockets, and seams. Both resin-treated and *Dacron*-and-cotton shirts can be washed and dried in the usual way (including the extraction or spin-dry cycle), and some, if dryer-dried at a low temperature, will require only light touch-up pressing.

There is a considerable difference in the resin finishes of the cotton wash-and-wear shirts. Some of the new cotton shirts can be bleached; others will pick up chlorine from the usual household bleach and are likely to become yellowed and weakened.

Manufacturers have made some changes in the stitching, construction, and trim of shirts to improve their ability to look well with casual wash-and-wear treatment. Nowadays many shirts are made with a single seam only, on the sleeves and the sides.

Most shirts nowadays do not have pleats down the front at the side of the buttonholes—and many have one-piece sleeves which have one less seam to pucker and one less seam to press (a real advantage). Permanent stays for collars are a recent development.

All the shirts tested were white shirts.

Dacron-and-cotton

A. RECOMMENDED

Arrow Wash'n'Wear (Cluett, Peabody & Co., Inc., Troy, N. Y.) $7.95.

Manhattan or Manhattan Docoma (The Manhattan Shirt Co., 444 Madison Ave., New York 22) $7.95.

Penney's Towncraft (J. C. Penney Co., Inc.) $4.98.

C. NOT RECOMMENDED

Longwear (New Process Co., Warren, Pa.) $3.97, plus postage.

Truval (Truval Mfrs., Inc., Empire State Bldg., New York 1) $4.95.

Dacron

A. RECOMMENDED

Penney's Towncraft Taslan Dacron (J. C. Penney Co., Inc.) $4.98.

Pilgrim (Sears-Roebuck's Cat. No. 33—378) $4.77.

Wings (Wings Shirt Co., 4 W. 33 St., New York 1) $5.99.

All-cotton shirts

A. RECOMMENDED

Manhattan Mansmooth (The Manhattan Shirt Co.) $5.95.

Jayson, Laundeze (F. Jacobson & Sons, Inc., 1115 Broadway, New York 10) $5. Permanent stays.

Pilgrim, Sonic (Sears-Roebuck's Cat. No. 33—334) $4.80, plus postage.

Shirtcraft N13 (Shirtcraft/Airman, Inc., Empire State Bldg., New York 1) $3.95.

Silver Wings (Wings Shirt Co.) $4.

Van Heusen Vantage (Phillips-Jones Corp., 417 Fifth Ave., New York 16) $5.

B. INTERMEDIATE

Penney's Towncraft Minimum Care Cotton (J. C. Penney Co., Inc.) $2.98.

▶ **REF:** BULLETIN, Mar. '58, Dec. '57+++.

WINTER SPORT SHIRTS

Sport shirts are customarily marked small, medium, large, or extra large—S, M, L, XL. The size markings represent measurements as follows:

Location	S (Small)	M (Medium)	L (Large)	XL (Extra Large)
Neck size	14–14½	15–15½	16–16½	17–17½
Chest	42	46	50	54
Total length	27½	28	28½	29

Where sleeve lengths are not given, sleeves on long-sleeved sport shirts are likely to be 33 inches long in a medium size, 34 inches in a large shirt.

MEN'S RAINCOATS

There is a wide difference in the water repellency of raincoats. A waterproof coat, one made of plastic film or rubberized or other coated fabric, will keep the rain out in any kind of storm. Completely waterproof coats, however, are likely to leave the wearer uncomfortably hot and damp from perspiration, especially in hot, humid weather.

Water-repellent coats are shower or rain resistant, but not waterproof. Since a water-repellent coat is not airtight, perspiration and condensation do not accumulate within it.

For raincoats other than rainproof ones, the suggested classifications for performance, in order of decreasing rain resistance, are: storm resistant, rain resistant, and shower resistant. A lined raincoat would be expected to provide more protection than an unlined one. In some cases, however, CR found that the outer fabric alone of a raincoat showed more resistance to rain than the outer fabric used over a lining fabric.

How repellent a coat will be after washing and dry cleaning depends almost entirely on how the washing and dry cleaning are done, particularly how well the garment is rinsed in the cleaning process. One solution to the problem is to have the raincoat treated with a water repellent after dry cleaning. The charge for this treatment, plus the cleaning, is likely to be about $2.50.

All the raincoats listed passed tests for rain resistance. A raincoat should have a collar that fastens closely around the neck, and buttons set well back from the edges of the front to give ample overlap. It should be long enough to protect other clothing. Slash-through pockets make it possible to reach through to the suit jacket or trousers without unbuttoning the raincoat. A tab and a button closure at the bottom of the coat will help keep it snug against the weather. For good appearance, stitching should be smooth and not puckered.

A. RECOMMENDED

Alligator, Superwon (The Alligator Co., 4153 Bingham Ave., St. Louis 16) $12.75. Rayon and cotton raincoat. Was the best coat tested in rain resistance.

Alligator, Platinum Label (The Alligator Co.) $49.75. All-wool worsted gabardine topcoat-raincoat.

Alligator, Gold Label (The Alligator Co.) $40.75. All-wool worsted gabardine topcoat-raincoat.

B. INTERMEDIATE

Alligator, Travelweight (The Alligator Co.) $19.75. Cotton raincoat.

Plymouth, Thunderbird (Plymouth Mfg. Co., 500 Harrison Ave., Boston 18) $27.50. *Dacron*-and-cotton raincoat.

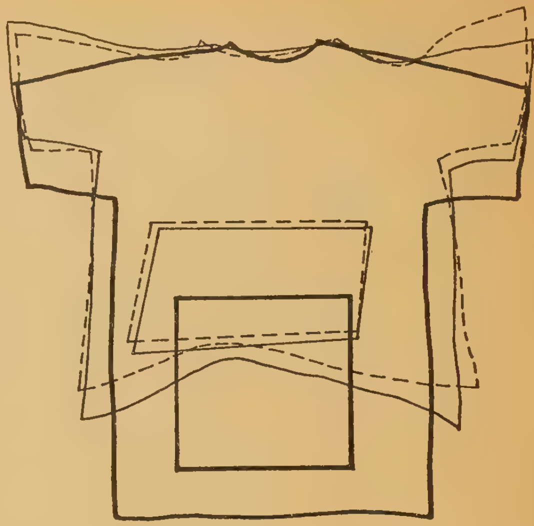
Rainfair, Cavalier (Rainfair Inc., Racine, Wis.) $18.50; $27.50 with all-wool zip-out lining. Rayon gabardine topcoat-raincoat.

MEN'S KNIT T-SHIRTS

Knitted garments often are discarded because of loss of size and shape during laundering. Bursting strength, weight per square yard, and size of the yarns are not related to this loss of shape, according to a study made by the Department of Agriculture's Institute of Home Economics. Usually it is the structure of the fabric that is at fault.

Sometimes knit fabrics are stretched and pulled as they are manufactured. When these garments are laundered, the loops return to their original shape, and the garment becomes shorter and wider. Look for T-shirts with firm, even knitting, with loops that appear more plump and round than long and narrow.

Consumers' Research found in its study of men's T-shirts, that a T-shirt of improper construction would become distorted whether drying was done on the line or in a dryer. The drawing shows what actually happened to one T-shirt in the study made by Consumers' Research following 5 (thin solid line) and 15 (broken line) successive washings and dryings. The square was 10 x 10 inches originally; it became smaller in one direction and distorted in shape as the shirt was washed and dried. This shirt was dried on a line; a shirt dried in an electric clothes dryer was similarly distorted.



Look for T-shirts that have reinforced shoulder seams. Some have a cord or a narrow tape insert in the seam, others have a strip of fabric sewn over it. Shoulder seams that are only single stitched will likely prove least secure in service. A neckband that is constructed so that it is seamless, or one that has the seam on the inside, is judged more desirable than other kinds.

A. RECOMMENDED

Healthgard, Better (Montgomery Ward's Cat. No. 29—460) 82c each, $2.40 for 3, plus postage. Rib knit. 2

Penney's Towncraft (Sold by J. C. Penney Co. stores) 98c each. Rib knit. 2

Pilgrim (Sears-Roebuck's Cat. No. 84—5182) 77c each, $3.04 for 4, plus postage. Rib knit. 2

Wrightswear (Wright's Health Underwear Corp., 345 B'way, New York 13) 89c each. Rib knit. 2

Arrow (Cluett, Peabody & Co., Inc., Troy, N. Y.) $1.25 each. Flat knit. 3

Club Fellow (Sold by Marshall Field & Co., Chicago 80) $1.25 each. Rib knit. 3

Healthgard, Best (Montgomery Ward's Cat. No. 29—475) $1.39 each, $4 for 3, plus postage. Flat knit. 3

Healthgard, DeLuxe (Montgomery Ward's Cat. No. 29—496) $1.39 each, $4 for 3, plus postage. Interlock knit. 3

Munsingwear (Munsingwear, Inc., Minneapolis) $1.50 each. Flat knit. 3

Reis Perma-sized (Robert Reis & Co., Empire State Bldg., New York 1) $1.25 each. Flat knit. 3

B. INTERMEDIATE

Fruit of the Loom 2525 (Union Underwear Co., Inc., Empire State Bldg., New York 1) 69c each, $2.05 for 3. Flat knit. 1

Pilgrim (Sears-Roebuck's Cat. No. 83—5188G) 37c each, $2.49 for 5, plus postage. Flat knit. 1

Allen-A, Dittos (The Allen-A Co., Piqua, Ohio) $1 each, $2.85 for 3. Flat knit. 2

B.V.D. (The B.V.D. Co., Inc., 265 Madison Ave., New York 16) 85c each, $2.53 for 3. Rib knit. 2

Hanes (P. H. Hanes Knitting Co., Winston-Salem, N.C.) $1 each. Flat knit. 2

Healthgard, Best (Montgomery Ward's Cat. No. 29—464) 97c each, $3.76 for 4, plus postage. Flat knit. 2

Healthgard, Better (Montgomery Ward's Cat. No. 29—473) 82c each, $2.39 for 3, plus postage. Flat knit. 2

Long Wear (New Process Co., Warren, Pa.) $4.35 for 5. Rib knit. 2

Pilgrim (Sears-Roebuck's Cat. No. 83—5186) 72c each, $3.04 for 4, plus postage. Flat knit. 2

Pilgrim, Royal Egyptian (Sears-Roebuck's Cat. No. 83—5054) $1.14 each, $3.36 for 3, plus postage. Flat knit. 2

Duocraft "De Luxe" (Duofold, Inc., Mohawk, N.Y.) $1.25 each. Flat knit. 3

Jockey (Cooper's, Inc., Kenosha, Wis.) $1.25. Flat knit. 3

C. NOT RECOMMENDED

Fruit of the Loom 4545 (Union Underwear Co., Inc.) 69c each, $2.05 for 3. Rib knit. 1

* * *

Shirts of the following five brands were considerably distorted after laundering.

Healthgard, Good (Montgomery Ward's Cat. No. 29—478) $1.94 for 3, plus postage. Flat knit. 1

Spiegel Full-cut (Spiegel's Cat. No. 43—3042) $1.96 for 4, plus postage. Flat knit. 1

Hansley (Hansley Mills, Inc., Paris, Ky.) 79c each. Flat knit. 2

Stedman (Stedman Mfg. Co., Asheboro, N.C.) $1 each. Flat knit. 2

Van Heusen (Phillips-Jones Corp., 417 Fifth Ave., N.Y.C.) $1 each. Flat knit. 2

▶ **REF:** Bulletin, Sept. '55.++++

MEN'S SOCKS

Socks should be purchased as carefully as shoes, so far as size is concerned, since a tight sock, like a tight shoe, can cause foot troubles. One authority recommends that socks should be at least a half inch longer than the foot measured at the longest toe. Conventional socks are available in seven to nine different sizes. The tendency of a "stretch sock" is, of course, to pull back on the toes. The Journal of the American Medical Association has carried an item unfavorable to the use of stretch socks for young children, and some physicians consider them unsuitable for use by adults, too. Stretch socks are normally available in three sizes.

Socks should be reinforced at the toe, the heel, the sole, and the region above the heel known as the high splice, so that all three parts have equivalent wear resistance in service. The reinforcement at the heel should extend 2½ inches up the back to reach well above the counter of the shoes.

Socks should be marked correctly as to size, but often they are not. The National Association of Hosiery Manufacturers adopted in 1956 a seal of approval program for all stretch and sized socks meeting minimum standards of measurement. The seal, which carries the name of the Better Hosiery Council, is given to socks that meet or exceed standards of "elasticity recovery, colorfastness, and size."

Shrinkage, too, should not be excessive, for the sock that is too short is not only uncomfortable, but will tend to wear out more quickly.

Synthetic fibers used in socks give trouble with static electricity, which may cause the socks to pick up fuzz and dirt as they are worn. In addition, some synthetic fibers tend to "pill" or roll up into small balls on the surface of the sock.

FUR-FABRIC COATS

Coats made of the pile fabrics of *Orlon,* rayon, or *Dynel-Orlon* are light in weight and attractive in appearance. These coats can be cleaned acceptably with proper handling, but the National Institute of Dry Cleaning warns that special dry-cleaning methods are required in handling them after they have become soiled. A certain amount of tufting (fibers matting together) from wear can be expected, and the Institute reports that this cannot be removed by any known method of dry cleaning. The fabric has a tendency to mat around the neckline, cuffs, and edges of pockets. Certain types of *Orlon*-pile coats become stiff and shrink after dry cleaning.

Preferably select a garment that carries a hang tag with clear instructions on how the garment is to be cleaned and take this tag to the cleaner for his information.

It will be well for women who purchase a coat of the new pile fabrics to keep in mind the possibility that the coat will retain its attractive appearance for only one season's wearing at most.

BOYS' SLACKS

Most mothers expect children's clothing to take hard wear, or at least to hold up for several months (through a school year, perhaps). If they can get good appearance and washability, too, so much the better. Construction details have a lot to do with the durability, appearance, and washability of boys' slacks. In good quality slacks, linings will be fairly smooth and flat; poorly cut facings can be bulky and uncomfortable. An unpieced crotch is smoother and softer than a pieced one, which can be stiff and bulky. For growing boys, in particular, an ample allowance for letting out is a good idea. Too skimpy an allowance on back seams does not permit an alteration to be made as the child grows.

A little boy will have trouble with a button that is too large for a buttonhole. A hook or a snap fastener on the waistband will likely be easier for him to handle.

The boys' slacks studied all were labeled "wash-and-wear" but one, the *Sears' Boyville* (4020). The *Sears'* slacks were described as "washable." Fabrics included were flannels, gabardines, and two lightweight fabrics—seersucker and pinfeather.

Gabardines showed more resistance to abrasion than the flannels, but they also showed wrinkles more than the flannels did and tended to become a little shiny at the pockets.

All of the slacks tested had a good appearance after pressing.

The prices of boys slacks depend in part on the size—the larger sizes carry higher price tags. Listings are in alphabetical order within the *A*, *B*, and *C* groups.

Samples tested were obtained in the winter of 1956, and may now be out of the manufacturer's lines although still available in some retail stores.

A. RECOMMENDED

Adler 4100 (Adler Pants Co., Inc., 162 Fifth Ave., New York 10) $7.95 for Juniors (sizes 6 to 12); $9.95 for Preps (sizes 12 to 22). 75% *Orlon*, 25% rayon flannel. Dark gray.

Adler 4200 J (Adler Pants Co., Inc.) $7.95 (6-12), $9.95 for Preps (12-22). 65% *Dacron*, 35% rayon gabardine. Dark brown.

David Copperfield, Westchester (Kalamazoo Pant Co., Kalamazoo, Mich.) $9.95 for Student sizes (25-34 waistbands). 75% *Orlon*, 25% viscose flannel treated with *Cravenette* finish. Gray.

Gold Nugget (Sobel & Goldman, Inc., 873 Broadway, New York 3) $9.98 for Preps (14-16). 65% *Dacron*, 35% viscose gabardine. Dark blue.

Happ (Happ Brothers Co., Inc., Broadway at Pine, Macon, Ga.) $9.95. A lightweight 75% *Dacron*, 25% cotton pinfeather. Blue and white striped fabric.

Happ (Happ Brothers Co., Inc.) $6.95. 75% *Orlon* and 25% nylon seersucker. Brown and white striped fabric.

Striders (Panzier Associates, Inc., 1107 Broadway, N.Y.C.) $7.95. Size 14. 65% *Dacron*, 35% viscose rayon gabardine. Brown.

B. INTERMEDIATE

Sea Wolf (Seattle Woolen Co., 2822 A St., Tacoma 1, Wash.) $6.95 (4-12); $7.95 (13-18). 70% *Acrilan*, 30% rayon gabardine. Blue.

Sears' Boyville (Sears-Roebuck's Cat. No. 40—4020) $4.97, plus postage. 65% wool, 35% *Orlon* flannel. Charcoal gray.

Tom Sawyer (Elder Mfg. Co., St. Louis 3) $6.98 (sizes 4-12); $8.98 (waistbands 25-32). 50% rayon, 25% acetate, 25% *Orlon* flannel. Light brown.

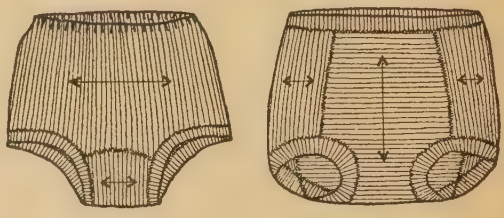
C. NOT RECOMMENDED

Tom Sawyer (Elder Mfg. Co.) $6.98 (sizes 4-12); $7.98 (waistbands 25-32). 80% rayon, 10% *Dacron*, 10% nylon gabardine. Dark brown.

▶ **REF:** Bulletin, May '57.+++

TRAINING PANTS

On some training pants, the ribs of the fabrics all go one way, up and down. These are shown at the left below and called, for convenience, the "regular" type. In another kind, the fabric goes two ways, so that the ribs go from side to side across the center of the garment, and up and down over the hips. By this construction, the crotch panel "give" is up and down, and the side sections stretch around the body. This type is shown at the right below and called for convenience "two-way" type.



Regular *Two-way*

On some of the "regular" pants, the pad is relatively small, and this might be considered a disadvantage, especially if the garment were to be worn by a very young child, only recently out of the diaper class. A large pad also reduces the chances of the child's being chilled when the garments are wetted.

There were three kinds of waistbands found on the garments tested by CR: (1) elastic ribbon; (2) a smooth fabric tunnel for elastic ribbon; and (3) a shirred or tucked tunnel. The shirred or tucked tunnel is sometimes unsatisfactory because the thread of the stitching may break as the elastic is stretched.

Like any garment made of knit fabric, training pants have a tendency to shrink. Some of the training pants washed and dried in the study reported shrank as much as 20 percent, equivalent to nearly two inches from the top of the band to the bottom of the crotch. On the whole, the training pants that were dried in the dryer shrank a little more than those dried on the line. Shrinkage of *A*- and *B*-rated pants was less than 15 percent in either direction except as noted.

Ratings are cr56.

A. RECOMMENDED

Gibbs (Gibbs Underwear Co., Empire State Bldg., New York 1) 59c. Two-way style. 2

Carter's (Wm. Carter Co., Needham Heights 94, Mass.) 85c. "Regular" style; no side seams. 3

Carter's Tykes (Wm. Carter Co.) 69c. Two-way style. 3

Carter's Tykes (Wm. Carter Co.) 85c. Two-way style. 3

Vanta (The Vanta Co., Inc., Brockton, Mass.) 69c. Two-way style. 3

B. INTERMEDIATE

Grants Bouncing Baby (Sold by W. T. Grant Co. Stores) 39c. "Regular" style. Shrinkage in length of pants dried in clothes dryer was greater than 15%. 1

Trebor (Trebor Knitting Mills Co., 250 44 St., Brooklyn 32, N.Y.) 39c. Two-way style. 1

Ward's Triple Crotch (Montgomery Ward's Cat. No. 31—356) Three for $1.10, plus postage. Regular style. Shrinkage in length of pants dried in clothes dryer was greater than 15%. 1

Nazareth (Nazareth Mills, Inc., 271 Church St., New York 13) 49c. Regular style. 2

C. NOT RECOMMENDED

Cozy-Dozy (Quality Mills, Inc., Mount Airy, N.C.) 25c. Regular style. 1

Fidelity (Sold by Murphy's 5-and-10-cent stores) 25c. Regular style. 1

Honeysuckle (Sears-Roebuck's Cat. No. 29—1050) Three for 69c, plus postage. Regular style. 1

Honeysuckle (Sears-Roebuck's Cat. No. 29—1051) Three for 69c, plus postage. Regular style. ¶Not in current catalog. 1

Med. Lark (Sold by Murphy's 5-and-10-cent stores) 29c. Regular style. 1

Spencer's (Mt. Airy Knitting Co., Mt. Airy, N.C.) 29c. Regular style. Shrank more than any other training pants tested. 1

Spanky Pants (Wm. Carter Co.) 69c. Regular style. Had raised seam (judged undesirable) on pad. 3

▶ **REF:** Bulletin, Aug. '56.+++

DIAPERS

Birdseye diapers are strong and will take up as much moisture as gauze and knit diapers though somewhat less than flannel diapers. Birdseye diapers are somewhat stiff when new, but become softer with use and laundering.

Flannel is a soft, napped fabric which is pleasant to the touch. In use, the nap wears off, and the diaper tends to become more smooth and less absorbent. Flannel diapers are superior to birdseye, gauze, and knit diapers in total absorption. They are better than birdseye diapers and a little better than gauze diapers in absorbing a lot of liquid quickly, but not nearly so good as knit diapers in this respect.

Gauze diapers are light in weight and dry quickly, but have a tendency to wrinkle and get out of shape. CR found the gauze diapers to be about the same as birdseye and knit diapers in total absorption and nearly as good as flannel in retaining liquid.

Knit diapers are preferred by some people because the knit fabric stretches as the baby moves. They are heavier than birdseye, flannel, or gauze diapers, however, and take longer to dry, and tend to get out of shape with use and laundering. They are about average in total absorption, but far superior to the other three kinds in retaining an amount of liquid suddenly released.

Some diapers have special provisions for diaper liners or disposable diapers or diaper pads that can be flushed away. Their use may be questioned in some homes, since some diaper liners do not disintegrate as rapidly as would be desirable and may therefore burden septic tank sewage disposal systems. The manufacturer of two brands of liners for diapers, however, have supplied test data to Consumers' Research indicating that the *Dennison* and the *Curity* diaper liners disintegrate satisfactorily in a septic tank and that therefore they may be flushed in a home toilet system with relative safety.

Do not mark diapers with any laundry marking pens; these may contain a poisonous aniline dye, which can be absorbed by the baby's skin, and has caused many cases of illness—even several deaths.

The Journal of the American Medical Association recommends that diapers be changed as soon as possible after they have become wet or soiled to prevent the formation of ammonia and maceration of the skin. The use of plastic or rubber pants should be limited to brief social occasions when prompt changing would be inconvenient. Rubber pants should never be left on throughout the night.

Looking for a diaper service? You can get a roster of diaper services from the National Institute of Diaper Services, 67 W. 44, New York 36.

Prices given are for a dozen diapers.

A. RECOMMENDED

Birdseye

Dexter (Fred Dexter & Staff, Houston, Tex.) $3.75. Sold with 2 pins on a chain. A shaped diaper. 2

Honeysuckle, Sanforized (Sears-Roebuck's Cat. No. 29—108) $3.46, plus postage. 2

Spiegel (Spiegel's Cat. No. 28—2821) $2.67, plus postage. 2

Wards Supreme (Montgomery Ward's Cat. No. 31—606) $2.69, plus postage. 2

Pin-Free (Pin-Free Diaper Mfg. Co., 89 Brighton Ave., Boston) $7.20. A shaped diaper with snaps. 3

Flannel

Honeysuckle, Best Quality (Sears-Roebuck's Cat. No. 29—102) $2.86, plus postage. 2

Gauze

Chix (Chix Baby Products Div., Chicopee Mills, Inc., 47 Worth, New York 13; Sears-Roebuck's Cat. No. 29—116) $3.75, postpaid. 2

Curity (Kendall Mills, Div. Kendall Co., Walpole, Mass.) $3.50. 2

Honeysuckle, Best Quality (Sears-Roebuck's Cat. No. 29—112) $2.89, plus postage. 2

Spiegel, Best Quality (Spiegel's Cat. No. 28—2826) $2.94, plus postage. 2

Wards, Supreme Quality (Montgomery Ward's Cat. No. 31—616) $2.96, plus postage. 2

Knit

Honeysuckle (Sears-Roebuck's Cat. No. 29—115) $3.20, plus postage. 2

B. INTERMEDIATE

Birdseye

Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29—105) $2.16, plus postage. 1

Wards, Better (Montgomery Ward's Cat. No. 31—608) $2.16, plus postage. 1

Honeysuckle, Better Quality (Sears-Roebuck's Cat. No. 29—106) $2.53, plus postage. 2

Honeysuckle, Better Quality (Sears-Roebuck's Cat. No. 29—107) $3.46, plus postage. Same diaper, but larger size than No. 29—106. 2

Keystone, Style 258 (Keystone Mills, Athens, Ga.) $4.98. A shaped diaper with snaps (3 and 3 per side). 3

Flannel

Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29—101) $2.16, plus postage. 1

Spiegel (Spiegel's Cat. No. 28—2822) $2.22, plus postage. 1

Wards, Better Quality (Montgomery Ward's Cat. No. 31—600) $2.24, plus postage. 1

Gauze

Honeysuckle, Good Quality (Sears-Roebuck's Cat. No. 29—111) $2.77, plus postage. 2

Spiegel, Good Quality (Spiegel's Cat. No. 28—2823) $2.74, plus postage. 2

Wards, Better Quality (Montgomery Ward's Cat. No. 31—602) $2.77, plus postage. 2

Pin-Free (Pin-Free Diaper Mfg. Co.) $7.20. A shaped diaper with snaps. 3

Knit

Pant-Ease (Pant-Ease Infant Wear Co., Arcade, N.Y.) $3.35. A tubular-knit diaper shaped with areas of different sizes of stitches. 2

C. NOT RECOMMENDED

Birdseye

Cone, Style 570 (Spiegel's Cat. No. 28—2891) $2.10, plus postage. 1

▶ **REF:** BULLETIN, Mar. '55.+++

SHOES

An authority on shoes and author of texts on footwear and foot health, William A. Rossi, suggests that of 16 basic shoe designs, eight are better for foot health than the others. The preferred ones are the oxford, blucher oxford, the ghillie, the gore, the moccasin, the monk, the low-heeled sandal, and the shawl-tongue shoe.

Not all of these, however, are suited to all kinds of feet. The moccasin, for example, while excellent for healthy normal feet is not advised for persons with serious foot disorders. Other styles of shoes may be entirely satisfactory for healthy feet and might even be better than some of the "preferred designs" if the size and last of a shoe of best design are not correct for the wearer.

The author notes that you can learn a great deal about the condition of your feet by studying the way your shoes wear out. Because of the shape or last of the shoe it is normal for heels to wear out at the back outside corner instead of straight at the back. If the counters run over or if the shank collapses, or the forepart of the shoe runs over as a regular thing in the various shoes that you have, it would be well to see a physician who specializes in the care of the feet. Arch-supporter shoes or other corrective shoes should not be worn except when and as advised by an orthopedic physician. Such shoes may do definite harm if they are worn when not needed.

A good fit can be assured only by trying on the shoes before purchase. The size can only be an approximate guide. In general, a half size smaller or larger represents a difference of 1/6 of an inch in the length of an adult's shoe and the increase of width of each successive width corresponds to 1/6 of an inch. There is considerable variation among shoes, even those marked with the same size, and there is no certainty that the size increments named are accepted throughout the shoe trade. Do not permit the shoe clerk to use a fluoroscope or X-ray device to check the fit (see section "Medicine, dentrifices, and hearing aids," page 110).

Children's shoes

A child's shoes should be replaced when the shoes have lost their original shape or when the child has outgrown them. A child has outgrown his shoes when the toes of his feet touch, or nearly touch, the end of the shoe, or the toe cap presses down on the toes, or when his foot spreads the upper of the shoe over the sole. Children's feet grow so rapidly that sometimes shoes may be too small before they are worn out. By the age of six, however, most youngsters, it is said, wear out even good-quality shoes before they outgrow them.

To assure good fit in shoes, have the clerk measure both feet, and fit the foot which is the longer. Measure while the child is standing, as well as sitting. A good fit can be judged by the following points; the rows of eyelets should be parallel; the shoe should be ½ inch to ¾ inch longer than the end of the big or longest toe; the widest part of the foot should be at the widest part of the shoe; the shoe should not gape at the sides or at the back when the child raises his heel and bends forward so that the weight of the body is on the toes; the back of the shoes should not slip or ride up and down in walking; and the shoe should feel comfortable.

"Orthopedic" or "corrective" shoes should not be worn by any child unless they have been prescribed by a doctor who specializes in foot conditions. Normal feet do not require rigid arch supports or additions made to the heels, and are prevented from obtaining normal exercise by such supports.

In its study, Consumers' Research had the children's shoes examined by a skilled orthopedic surgeon for design. In general, all shoes met the requirements for good design. Several, however, had built-up insteps, which are not recommended except on the advice of a physician.

The test methods included a complete dissection of the shoes, and a lengthy series of measurements and observations on the component parts. In addition, pairs of the shoes were worn by a group of boys in an orphanage during a period of approximately 5 months.

All the shoes had rubber heels, except as noted. Rubber heels, although desirable because they lessen jarring and are quieter, are not as durable as leather heels and tend to run over on the side. The *Proud-Fit* and *Storybook* shoes had stitchdown construction; all the others tested were made by the welt process, which is the more desirable. Prices shown in the listings are for the sizes purchased for test.

A. RECOMMENDED

Buster Brown (Brown Shoe Co., St. Louis 18) $6.95 and $7.95. **2, 3**

Child Life (Herbst Shoe Mfg. Co., Milwaukee 45) $7.95. **3**

Fleet-Air (Eby Shoe Corp., Ephrata, Pa.) $7.95. **3**

Flying Aces (Dr. A. Posner Shoes, Inc., New York 1) $7.95. **3**

Weather-Bird (Peters Shoe Co., Div. International Shoe Co., St. Louis) $7.95. Insole extends to form arch support which may not be desirable unless prescribed by a physician. **3**

B. INTERMEDIATE

Acrobat (Acrobat Shoe Co., Div. General Shoe Corp., Nashville 3, Tenn.) $6.95. Insole extends to form arch support (see *Weather-Bird*). **2**

Classmate (Ideal Shoe Mfg. Co., Milwaukee 12) $6.95. **2**

Sundial Bonnie Laddie (Sundial Shoe Co., Div. International Shoe Co., Manchester, N.H.) $6.95, **2**

Edwards (J. Edwards & Co., Philadelphia 7) $7.98. **3**

Foot-so-Port (Foot-so-Port Shoe Co., Oconomowoc, Wis.) $10.95. A corrective shoe with built-up arch and Thomas heel; should be worn only when prescribed by physician. **3**

Kali-sten-iks (The Gilbert Shoe Co., Thiensville, Wis.) $8.95. Shoes toe in; may be unsatisfactory for many children from an orthopedic standpoint. **3**

Official Boy Scout (International Shoe Co.) $7.45 and $8.45. **3**

Pied Piper (Pied Piper Shoe Co., Wausau, Wis.) $8.95 and $9.50. 3

Pro-tek-tiv (Curtis, Stephens, Embry Co., Inc., Reading, Pa.) $8.50. 3

Simplex Flexies (Simplex Shoe Mfg. Co., Milwaukee 1) $8.95. 3

Stride Rite (Green Shoe Mfg. Co., Boston) $7.95 and $8.95. 3

C. NOT RECOMMENDED

Little Yankee (The Yankee Shoemakers) $6.95. 2

Poll-Parrot (International Shoe Co.) $6.98. This shoe would be rated *A* except for its being unlined; lack of lining considered undesirable. 2

Proud-Fit (Albert H. Weinbrenner Co.) $5.95. 2

Storybook (Storybook Shoe Co.) $5.95. 2

▶ **REF:** BULLETIN, Aug. '55.

MEN'S RUBBERS

For good construction, men's rubbers should have soles with rolled edges, or, if the edges are not rolled, soles that are reinforced by strips of rubber; heels that are thick and stiff; and an edge around the top of the upper that is strong and preferably reinforced to minimize the tendency to tear.

Most men's rubbers are lined with a knitted cotton fabric. It is easier to put a rubber on and take it off when there is a lining, and the lining adds strength to the rubber. All the rubbers tested but three, the *Converse*, *Tingley*, and the *U. S. Rubber*, were lined. The *Converse* and the *U. S. Rubber* had cloth inserted between the layers of rubber in some areas. The *Tingley*, on the other hand, was an all-rubber shoe.

Men's rubbers are available in a number of different styles. The clog style has an upper that extends upward only a short distance above the sole and protects only the sole of the shoe and a small portion of the upper. The storm style has a center extension to cover the laced portion of the shoe. The semi-storm, high-low, or sandal styles lack the tongue extension, but still cover more of the shoe than the clog.

Since men's rubbers become useless when the soles or the heels wear through, the resistance to abrasion in these areas and the thickness of sole and heel were important factors considered in determining the ratings. Rubbers were black except as noted.

A. RECOMMENDED

Servus Loyal (Servus Rubber Co., Rock Island, Ill.) $2.99. Sandals. Wearing properties, best of rubbers tested.

The following five were considered somewhat less desirable than the *Servus* rubbers.

Gold Bond (Sears-Roebuck's Cat. No. 76—9151) $2.57, plus postage. Storm rubbers.

Gold Bond (Sears-Roebuck's Cat. No. 76—9149) $2.57, plus postage. Sandals.

Goodyear Deluxe Brogue (Goodyear Glove Brand Footwear, Div., U. S. Rubber Co., Naugatuck, Conn.) $2.69. Storm rubbers.

Hood Brogue (Hood Rubber Co., Div. of B. F. Goodrich Co., Watertown, Mass.) $3.25. Storm rubbers.

U. S. Rubber Zephyr Hi Cut Sandal (U. S. Rubber Co., New York 20) $2.50. Sandals.

B. INTERMEDIATE

Goodrich Fit-All, General (B. F. Goodrich Co., Akron, Ohio) $2.95. Storm rubbers.

Tingley (Tingley Reliance Rubber Corp., Rahway, N.J.) $3.29. Storm rubbers.

Wards Commonwealth (Montgomery Ward's Cat. No. 24—9488) $2.45, plus postage. Storm rubbers.

C. NOT RECOMMENDED

American Ardsley (American Rubber Co.) $1.99. Sandals.

Converse Cloglite Universal (Converse Rubber Co., Malden, Mass.) $3.25. Brown clogs.

▶ **REF:** BULLETIN, May '57.++

STORMBOOTS FOR WOMEN

To be serviceable, women's stormboots must fit the shoe well. The fit at the heel is especially important, since a small shoe heel can cut into a wide overshoe heel, and a wide shoe heel can crush an overshoe heel that is too small for it.

In shopping for stormboots, it is a good idea to wear to the store the shoes over which you expect to wear the boots. If this is impracticable you can determine the heel size by measuring the shoe heel: the inner heel height and also the distance from front to back of the heel at its widest part. From these two measurements, the shoe clerk can determine the heel type into which your measurements fall.

Generally, boots are available with a low heel, medium Cuban heel, and a walking heel. In the study by Consumers' Research, not all the samples tested were made to fit over heels of the same size, but many brands are available in a range of styles for heels of various types.

The women's rainboots tested in CR's study included several different types, from plastic boots to so-called galoshes. The weights (of a pair) of the rainboots tested ranged from about 6 ounces to almost 16 ounces.

Plastic boots are light in weight. They can also be washed inside and out, and thus need never transfer dirt to shoes or hose. Some of them pick up dye from the shoes, however, and become stained with wearing. Fairly heavy boots with rubber soles are often made with lightweight cloth uppers, treated to be waterproof.

For good protection, the material from which the boot is made, and also the seams, should be waterproof. Furthermore, there should be a gore, rather than a simple flap, at any opening.

A. RECOMMENDED

Glove Brand Snuglites (Goodyear Glove Brand Footwear, Div., U. S. Rubber Co., Naugatuck, Conn.) $2.98. Black plastic boots of medium weight.

Marxie-"totes" (So-Lo Marx Rubber Co., Loveland, Ohio) $2.95. Flexible latex rubber boots of light weight.

Red Ball plyron (Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.) $1.99. Colorless translucent plastic boots of medium weight.

U. S. Rainpals Gaytees (United States Rubber Co., Naugatuck, Conn.) $2.25. Colorless translucent plastic boots of medium weight.

B. INTERMEDIATE

Ball Band Thermo-Lites (Mishawaka Rubber & Woolen Mfg. Co.) $3.99. Black rubber-like boots, heaviest of those tested.

Rain Dears (Lucky Sales Co., Inc., Los Angeles) $1.98. Clear plastic boots of medium weight.

Rainlosh (Hood Rubber Co., Watertown 72, Mass.) $4.50. Black cloth boots with rubber soles of medium weight.

Rainstar Frost Lo-Cub (B. F. Goodrich Rubber Co., New York City) $2.25. Colorless translucent plastic boots of heavy weight.

U. S. Raintones Gaytees (United States Rubber Co.) $2.95. Black plastic boots of medium weight.

C. NOT RECOMMENDED

Commonwealth (Montgomery Ward's Cat. No. 24—9427) $3.98, plus postage.

Gold Seal (Goodyear Rubber Co., Middletown, Conn.) $4.50.

RaynBoots Rayn Lady (The Cambridge Rubber Co., Cambridge, Mass.) $3.49. The boots were good, but rear seams of uppers of the pair tested were not waterproofed. The manufacturer claims boots of later manufacture have waterproof seams.

▶ **REF:** BULLETIN, Apr. '57.++

Availability of government bulletins

GOVERNMENT BULLETINS listed in this CONSUMER BULLETIN ANNUAL may be bought from the Superintendent of Documents, Washington 25, D.C. Prices are subject to change, and bulletins sometimes become unavailable. The Superintendent of Documents will furnish prices of specific bulletins and lists of selected bulletins on certain subjects upon request.

How to locate local dealers

CONSUMERS' RESEARCH cannot give information on local sources of supply of products listed. The BULLETIN in most cases gives the names of manufacturers. Inquiries as to local distributors should be addressed to the principal office of the company or to the office listed under the company's name (General Electric, Westinghouse, etc.) in the city telephone directory.

Musical instruments

ELECTRONIC ORGANS

Spinet models

A. RECOMMENDED

Baldwin ● **Conn** ● **Hammond.**

* * *

The following had not been in use for a sufficiently long time to warrant an unqualified *A-Recommended* rating.

Allen ● **Gulbransen** ● **Kinsman** ● **Minshall** ● **Wurlitzer** (vacuum-tube type).

B. INTERMEDIATE

Estey ● **Thomas** ● **Wurlitzer** (reed type).

▶ **REF:** BULLETIN, "Electronic organs for the home, with ratings of spinet models," Feb. '58+++; "Electronic organs for churches," Aug. '58+++.

SPINET PIANOS

A spinet piano, sometimes called a console piano, is an attractive piece of furniture. It is usually only 36 to 41 inches in height and fits in with other furnishings in the home much better than the tall upright piano of some years ago. Although musicians consider it tonally and mechanically inferior to the old-fashioned upright piano, and very far below the grand piano, many people find that a spinet satisfies their requirements reasonably well.

Prices were taken from manufacturers' retail price lists, and are subject to change. Listings are in alphabetic order within the two groups.

A. RECOMMENDED

Baldwin (Acrosonic), 40-in. models (Baldwin Piano Co., Cincinnati 2) $1064.

Chickering (Chickering & Sons, Division Aeolian American Corp., East Rochester, N. Y.) $990 to $1230.

Knabe (William Knabe & Co., Division Aeolian American Corp., East Rochester, N. Y.) $1040 to $1320.

Mason and Hamlin (Mason & Hamlin Co., Division Aeolian American Corp.) $1290 to $1577.

Sohmer (Sohmer & Co., Inc., 31 W. 57, New York 19) $975 to $1295.

Steinway (Steinway & Sons, 109 W. 57, New York 19) $1475 to $1730.

B. INTERMEDIATE

Cable (Conover-Cable Piano Co., Oregon, Ill.) $595 to $820.

Cable-Nelson (Everett Piano Co., Division of Meridan Corp., South Haven, Mich.) $495 to $695.

Everett (Everett Piano Co., Division of Meridan Corp.) $745 to $945.

Fischer (J. & C. Fischer, Division of Aeolian American Corp.) $828 to $905.

Gulbransen (Gulbransen Co., 2050 N. Ruby, Melrose Park, Ill.) $525 to $820.

Hardman (Hardman, Peck & Co., 33 W. 57, New York 19) $870 to $1165.

Harrington (Hardman, Peck & Co.) $725 to $765.

Ivers & Pond (Ivers & Pond Piano Co., 2718 Pershing Ave., Memphis, Tenn.) $850 to $1045.

Janssen (Janssen Piano Co., Inc., 237 E. 23, New York 10) $595 to $895.

Jesse French (Jesse French & Sons, Division of P. A. Starck Piano Co., 234 S. Wabash, Chicago 4) $645 to $905.

Kimball (W. W. Kimball Co., Cornell at Armitage, Melrose Park, Ill.) $595 to $965.

Kranich & Bach (Kranich & Bach, 327 Walnut Ave., N.Y.C.) $935 to $1095.

Lester (Lester Piano Mfg. Co., Inc., Lester 13, Pa.) $535 to $1028.

Minipiano (Hardman, Peck & Co.) $595 to $795.

Poole (Poole Piano Co., 2718 Pershing Ave., Memphis, Tenn.) $565 to $775.

George Steck (George Steck, Division of Aeolian American Corp.) $828 to $905.

Story & Clark (Story & Clark Piano Co., 28 E. Jackson Blvd., Chicago 4) $675 to $1195.

Winter (Winter & Co., Inc., 863 E. 141, New York 54) $525 to $895.

Wurlitzer (The Wurlitzer Co., DeKalb, Ill.) $437 to $795.

▶ **REF:** BULLETIN, Aug. '55.

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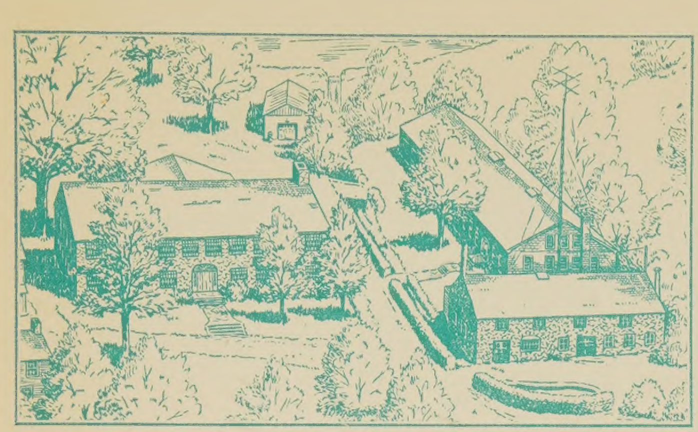

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